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A STEADY-STATE ANALYSIS OF PROPOSALS TO REDUCE THE TAX ON SAVING

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Abstract

This paper sets forth a stylized model for estimating the "steady-state" revenue effects of tax proposals designed to affect saving. A steady state occurs when the system of contributions and withdrawals has completed a full life cycle. The model estimates steady-state revenue yields per dollar contributed under four different systems of taxing saving: fully taxing it, allowing a deduction for contributions, allowing tax-free withdrawals, and allowing temporary deferral of investment income. The model then applies those revenue yields to estimates of how savings would be shifted among systems under a given proposal. The paper uses the President's 2006 proposal to allow $5,000 annual contributions to lifetime savings accounts (LSAs) to illustrate the application of the model. It concludes that the annual cost of the LSA proposal (including several other smaller proposals) in the steady state will be $17.0 billion ($19.9 billion, if the Economic Growth and Tax Relief Reconciliation Act of 2001 were to expire).

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1. Introduction and Summary

Conventional budget windows of five or 10 years often provide an incomplete picture of the revenue effects of tax proposals designed to affect saving, particularly retirement saving. A disproportionate share of the long-term revenue impacts from such a proposal may appear within or fall outside of the budget window. For example, expanding deductible individual retirement accounts (IRAs) has two direct budgetary effects: increasing deductions and exclusions in the near term (which reduces revenue) and increasing taxable withdrawals in the longer term (which increases revenue). The former effect will show up in the budget window, while the latter, for the most part, will not, making the provision appear more expensive than it really is. Expanding Roth IRAs has the opposite effect: the investment income excluded from taxation compounds over time, so that most of the revenue loss from the provision falls outside of the budget window, making the provision appear less expensive than it really is.

The approach taken here in evaluating the revenue cost of such provisions is to estimate what the annual revenue loss would be once a system of contributions and withdrawals had completed a full life cycle and reached a "steady state." This paper sets forth a stylized model for estimating steady-state revenues and illustrates it by estimating the steady-state revenue cost associated with recent proposals for expanding tax-favored retirement savings plans: specifically, the President's 2006 budget proposals to consolidate various types of IRAs into a new vehicle called a retirement savings account (RSA) and to create a new saving incentive, the lifetime savings account (LSA), that would provide tax benefits for shorter-term saving.[1]

[1]Those proposals generated interest from the policy analysis community focused on measuring their budgetary cost over the long term and estimating their effects on private saving. The Congressional Budget Office included the latter effects in its dynamic analysis of the President's budget (see Appendix C of Congressional Budget Office, *An Analysis of the President's Budgetary Proposals for Fiscal Year 2006*, March 2005). That analysis, however, was limited to the 10-year budget window utilized by the Senate in its budget process.

According to the analysis, the President's proposals would lose $17.0 billion dollars of revenue per year in 2006 dollars relative to a baseline in which the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA) was permanently extended.[2] That is a significantly larger revenue impact than would be apparent from estimates that consider just the first 10 years. Over 90 percent of that loss is attributable to LSAs. The extension of EGTRRA provisions relating to retirement saving would lose $2.9 billion of revenue in the steady state relative to pre-EGTRRA law (under an assumption contrary to the pre-EGTRRA statute of full indexing of all dollar limits and thresholds). Thus, the expiration of EGTRRA would increase the steady-state revenue loss from the RSA/LSA proposals to $19.9 billion.

2. Overview of the Individual Savings Proposals

The tax law has long provided incentives for retirement saving. Those incentives were significantly enhanced by EGTRRA. The RSA/LSA proposals would alter those incentives and add a major new saving incentive not directed at retirement.

Pre-EGTRRA Law

Since 1982, workers have been able to save for retirement through an IRA.[3] Contributions to traditional IRAs are deductible from current taxes, and earnings on those contributions accumulate tax-free; however, withdrawals are fully taxable. Because the tax benefits of such plans are realized immediately upon contribution, they are sometimes called "front-loaded." Since 1998, "back-loaded," or Roth, IRAs have been allowed. Contributions to such accounts are not deductible, but earnings accumulate tax-free,

[2]The President's 2007 budget contains a proposal very similar to the one in the 2006 budget. Its effects would differ slightly from those presented here because its later effective date changes the indexed values of its contribution limits relative to those under the baseline.

[3]IRAs were first made available in 1975 but until 1982 were limited to workers not covered by an employment-based plan.

and withdrawals are not taxed. Prior to EGTRRA, contributions to traditional and Roth IRAs were limited to the lesser of earned income or $2,000 per year.[4]

The full tax benefits of traditional IRAs are available to all workers not covered by an employment-based plan (and whose spouses are also not covered) and to all workers below certain income thresholds, regardless of their coverage status. Those not eligible for full tax benefits may still contribute and have the investment earnings accumulate tax-free, but such contributions may not be fully deductible, and the investment earnings will be taxed upon withdrawal.[5] For unmarried workers, the deductibility of contributions phases out between $50,000 and $60,000 of modified adjusted gross income (AGI).[6] For married workers filing joint tax returns, the phaseout range depends on whether the worker or the worker's spouse is covered by an employment-based plan. If the worker is covered, the phaseout range is $75,000 to $85,000 (increasing in 2007 to between $80,000 and $100,000); if the worker is not covered but the worker's spouse is covered, the phaseout range is between $150,000 and $160,000.

The full tax benefits of Roth IRAs are available to all workers below certain income thresholds, regardless of their coverage status. Allowable contributions phase out between $95,000 and $110,000 of AGI for unmarried workers and between $150,000 and $160,000 of AGI for married workers filing joint returns. Taxpayers with less than $100,000 of AGI may also convert traditional IRAs to Roth IRAs if they include the converted amount in taxable income. Withdrawals prior to age 59½ from either a traditional IRA or a Roth IRA are subject to a 10 percent penalty tax unless used for certain approved purposes.

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[4]A nonworking spouse could also contribute up to $2,000 out of the working spouse's earnings.

[5]Commonly known as "nondeductible IRAs," such plans will be referred to here as "partially back-loaded" to distinguish them from Roth IRAs, which are also nondeductible but are fully back-loaded.

[6]That is, AGI without any IRA deductions.

The tax code also allows employers to give their employees the option of deferring a portion of their compensation to a front-loaded retirement plan, the most common of which is known as a 401(k) plan. Employers usually match all or part of employee contributions. The limit on employee contributions to such plans was $10,500 in 2001 (just prior to EGTRRA's enactment), but that limit was indexed to inflation and probably would have reached $12,000 by 2006.[7]

EGTRRA Provisions Relating to Retirement Saving

Under EGTRRA, the limits on contributions to traditional and Roth IRAs increase to $4,000 per year in 2006. Taxpayers age 50 and older may contribute an extra $500 per year. Those amounts are scheduled to increase to $5,000 and $1,000, respectively, by 2008. Thereafter, the limits will be indexed for inflation.

The contribution limits for 401(k)s increase to $15,000 in 2006, with an additional $5,000 contribution allowed for taxpayers age 50 and above. Furthermore, Roth 401(k)s will be permitted beginning in 2006. A tax credit available to lower-income IRA and 401(k) contributors was enacted as part of EGTRRA, but it expires after 2006.

In 2011, all of the remaining provisions of EGTRRA expire. That is long before any steady state could be achieved, so pre-EGTRRA law would be the proper current-law baseline under conventional revenue-estimating rules. The President has called for the indefinite extension of EGTRRA, however. The

[7]Other types of front-loaded retirement plans offered by employers, such as 403(b) plans, 457 plans, and SIMPLEs, are described in *CBO's On-Line Guide to Tax Incentives for Retirement Saving*.

permanent extension of EGTRRA is used as the primary baseline for evaluating the RSA/LSA proposals, but current law is also used as a baseline.[8]

The RSA/LSA Proposals

The proposals examined here would restructure individual retirement saving and add a new saving incentive not linked to retirement. A steady-state cost of a related proposal—to consolidate employment-based defined-contribution plans that allow employee deferrals into employee retirement savings accounts (ERSAs), which would look very similar to 401(k)s—is not considered here.

Retirement savings accounts. The proposals would replace both traditional and Roth IRAs with RSAs. Those accounts would closely resemble Roth IRAs, with the following differences:

- The limit on contributions would be $5,000, indexed for inflation after 2006;
- All workers could contribute the maximum (up to the amount of their earnings), regardless of their AGI; and
- Penalty-free withdrawals would be allowed at age 58, but all exceptions to the penalty other than death and disability would be eliminated.

New contributions to traditional IRAs would be prohibited, although traditional IRAs would still be allowed to receive rollovers from front-loaded employment-based plans. Owners of traditional IRAs could retain their accounts or convert them to RSAs after paying tax on the accumulated balance. Those

[8]The Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA) does not contain any retirement savings provisions but does affect how investment income outside such accounts is taxed. The President has also proposed the permanent extension of many features of JGTRRA, and the analysis of the extension of EGTRRA should be understood throughout this paper to include the JGTRRA provisions affecting investment income.

owners converting IRAs during 2006 would be allowed to prorate the resulting tax liability over four years.

Lifetime savings accounts. In addition to RSAs, the proposals would provide for a new type of savings vehicle known as the LSA. LSAs would be structured like RSAs, with three important differences. First, LSAs could be established by or on behalf of anyone. Second, the contribution limit of $5,000 per year would not be reduced if earnings were lower than that amount. Third, funds could be withdrawn from an LSA without penalty at any time and for any reason.

During 2006, owners of Coverdell education savings accounts and qualified state tuition plans would be permitted to convert their balances to LSAs. Those other plans would, nevertheless, continue to exist in their current form.

3. A Model of Steady-State Revenue Effects

At the core of this analysis is a model that estimates steady-state revenue effects. Before presenting it, however, it is useful to clearly define what is meant by the steady state. Also, it is important to recognize that some features of the tax law never achieve a steady state and thus do not lend themselves to this type of analysis.

Definition of Steady State

What does it mean to say that a system has reached a steady state? Say that all IRA participants made contributions over a 15-year period, then withdrew the funds over a 10-year period. During the first 25 years of the program, the system would not be in a steady state because each year would see the addition of a new cohort of either contributors or withdrawers without the corresponding demise of an older

cohort. Beginning in year 26, however, each new cohort of contributors would be offset by an older cohort switching from being contributors to being withdrawers, and that new cohort of withdrawers would be offset by an even older cohort exiting the system altogether. Thus, the steady state would begin in the 26th year.

A true steady state is never actually achieved in the real world. For one thing, participants behave differently—they do not all contribute over a 15-year period, nor do they all make withdrawals over a 10-year period. Furthermore, demographic changes ensure that new cohorts are rarely the same size as the ones they replace, thereby adding an additional element of unsteadiness. A steady-state model, therefore, must necessarily be stylized to some degree or another. The model presented here ignores all demographic changes and assumes two kinds of saving: long-term saving, which is devoted to retirement and follows the 25-year cycle described above; and short-term saving, which is for nonretirement purposes and follows a 12-year cycle of eight years contributing and four years withdrawing.

Model Overview

The model works in three steps: (1) tracking the contributions, investment income, and withdrawals of enough cohorts to reach the steady state; (2) calculating the annual revenues that would be received in the steady state under each of four possible tax systems; and (3) dividing those revenues by the pretax contributions made in the corresponding year. The resulting estimates of revenue per dollar contributed represent the steady-state revenue yield (RY) rate and can be applied to estimates of how contributions to different types of plans would change under a proposal. If, for example, a particular proposal implied a shift in funds from taxable accounts to front-loaded accounts, the steady-state revenue cost would be derived by subtracting the steady-state RY rate under the front-loaded system from that under the fully taxable system, then multiplying the difference by an estimate of the amount shifted (which the model

recognizes as a decrease in contributions to taxable accounts and an increase in contributions to front-loaded plans). The same procedure can be used for any combination of tax systems. The key to successful application of the model is correctly identifying the likely direction in which funds will flow, then deriving reasonable estimates for the magnitude of those flows.

The algebraic formulae behind the model are laid out in Appendix A. Most important for immediate purposes, however, are the steady-state RY rates for each tax system (see Table 1A), and the differences between them (see Table 1B). Those values depend on four major parameters:

1. The annual real rate of growth in wages and salaries, assumed here to be 2.1 percent;[9]
2. The real rate of return on investments, assumed here to be 3.3 percent;[10]
3. The regular tax rate on contributions and withdrawals, assumed here to be 22 percent under current law and 20 percent under permanent EGTRRA law;[11] and
4. The tax rate on investment income in fully taxable accounts, assumed here to be 16 percent under current law and 12 percent under permanent EGTRRA law.[12]

The model assumes that overall saving—both long- and short-term— is insensitive to the tax law, so that a change in the law would have no effect on the size of the economy. That assumption conforms to

[9]From the final year of CBO's winter 2005 forecast, which projects nominal wage growth of 4.3 percent and inflation of 2.2 percent.

[10]From the final year of CBO's winter 2005 forecast, which projects a 5.5 percent rate of interest on 10-year Treasury bonds and inflation of 2.2 percent. The use of a risk-free rate is standard for both long- and short-term revenue estimates.

[11]From CBO's individual income tax model. The tax rate on contributions need not be equal to the tax rate on withdrawals but is assumed to be so for purposes of this model. Empirical evidence supports the notion that the two tax rates, averaged over all contributors and all withdrawers, are similar in any given year. That does not imply, however, that any individual participant will experience the same tax rate upon withdrawal as at the time of contribution.

[12]From CBO's individual income tax model.

standard revenue-estimating conventions. There is a wide range of opinion among economists on the magnitude of any dynamic effects (that is, the extent of new saving stimulated by the tax advantages and the effect of that new saving on the size of the economy) and how those effects should be estimated. CBO's *An Analysis of the President's Budgetary Proposals for Fiscal Year 2006* contains a discussion of the dynamic effects of the LSAs and RSAs proposed at that time.

When a Steady State Is Impossible

Sometimes the tax law is structured in a way that makes it impossible to reach a steady state. The phaseout ranges on IRA deductibility are one such example. Because those ranges are not indexed for inflation, more people each year will fall above the range and fewer below it as incomes increase. As a result, the deductible share of contributions to traditional IRAs will decline over time, making it impossible to estimate a steady-state level of deductible and nondeductible contributions.

A related problem arises with respect to the contribution limits themselves. The model can accommodate provisions that increase the limits even when they are not indexed to inflation, but it cannot accommodate a switch from unindexed to indexed limits. That situation results in a constantly increasing level of contributions that is incompatible with a steady-state analysis.

Because the contribution limits and the phaseout range under pre-EGTRRA law—the proper current-law baseline—are not indexed but the contribution limits under all other alternatives are indexed, a true steady-state analysis cannot be performed. Therefore, it is necessary to remove the change from nonindexed to indexed limits from the analysis. In other words, the actual baseline in this analysis is pre-EGTRRA law as if it were fully indexed beginning in 2006. That assumption significantly reduces the apparent revenue cost of the various proposals.

How a Steady-State Analysis Differs from Present Discounted Value

Given the incomplete picture that revenue estimates in a five- or 10-year budget window present, analysts have occasionally measured the true revenue cost of a saving incentive by calculating the present discounted value of its projected revenue stream. Under that method, future revenue streams are discounted each year by the expected rate of return. Thus, if a traditional IRA earned 7 percent per year, the net revenue associated with the deductions, exempt earnings, and taxable withdrawals in each future year would be discounted by 7 percent for every year since the base year. The results would then be summed over all years to get the present value of net revenue. With that method, it can be demonstrated (with the assumption that tax rates remain constant) that the present value of the revenue yield of a Roth IRA is identical to that of a traditional IRA to which the same amount is dedicated.[13]

A steady-state analysis, in contrast, does not attempt to measure the total revenue cost of a saving incentive over a long period. Instead, it focuses on a point-in-time snapshot, during which the revenue yields of front- and back-loaded systems are inevitably different. In focusing on a point in time, the steady-state analysis is similar to the presentation of traditional revenue estimates; it just selects a time during which the snapshot will reflect a permanent, rather than temporary, condition.[14]

The difference between the revenue yields of front- and back-loaded accounts, compared with the baseline of a taxable account, changes over a 25-year cycle and beyond (see Figure 1). The difference does not change over the first 15 years: both yields decline by the same amounts, reflecting the lost

[13] An important factor to keep in mind is that a portion of what is dedicated to a Roth IRA is paid in taxes prior to depositing the contribution. Thus, if the tax rate was 20 percent, dedicating $2,000 to a Roth IRA would imply a tax payment of $400 and a contribution of $1,600—which would have the same present value as a $2,000 contribution to a traditional IRA.

[14] Simply expanding the budget window might allow traditional revenue estimates to present a complete picture depending on the length of the savings cycle involved. A 20-year budget window, for example, would present a complete picture of proposals to reduce the tax on short-term saving but not on long-term saving.

revenue from tax-free inside buildup. The revenue yield for the front-loaded account is much more negative over that period, however, because of the deductibility of the contributions. Over the next 10 years, when withdrawals occur, the revenue yield of the back-loaded account continues to become more negative, but it does so more slowly than it did earlier as withdrawals impede the rate of inside buildup. The revenue yield of the front-loaded account, in contrast, becomes rapidly less negative because of the taxes collected on withdrawals. By the end of the 25-year cycle, the revenue yield of the front-loaded account is less negative than that of the back-loaded account, a condition that persists throughout the steady state.

Because the steady-state revenue-yield gap in favor of the front-loaded account continues indefinitely, it would appear to dominate the earlier gap that favors the back-loaded account for the first 23 years. Because the later years are more heavily discounted in a present-discounted-value analysis, however, it turns out that the steady-state gap in favor of the front-loaded account exactly offsets the earlier gap in favor of the back-loaded account. Hence, the steady-state analysis and the present discounted value analysis generate different conclusions. A complete understanding of the impacts requires that the near-term revenue effects, the present discounted value, and the steady state all be considered.

4. Estimating Baseline Contributions

Because of the uncertainty surrounding the expiration of EGTRRA, it is helpful to construct two baselines. The first—"indexed current law"—reflects pre-EGTTRA law (except that the various IRA thresholds are assumed to be indexed to inflation), which will return in 2011 if EGTRRA expires. The second benchmark —the "permanent EGTRRA law" baseline—reflects a fully phased-in EGTRRA and incorporates the assumption that all provisions except the saver's credit are made permanent. In constructing those two baselines, it is possible to estimate the steady-state revenue loss associated with

the retirement savings provisions of EGTRRA and the (large) subset of its provisions that would be retained under the RSA proposal. Unless otherwise indicated, all amounts are expressed in 2006 dollars.

Pre-EGTRRA Law

Although 2001 was the last year before EGTRRA went into effect, 2000 is the most recent year for which complete data are available on IRA deductions, nondeductible contributions to traditional IRAs, contributions to Roth IRAs, and employee contributions to 401(k)-type plans. IRA contributions for that year were as follows:[15]

- Deductible contributions to traditional IRAs—$7.5 billion
- Nondeductible contributions to traditional IRAs—$2.6 billion
- Contributions to Roth IRAs—$11.6 billion

Because most of those contributions were from taxpayers constrained by the limit, the dollar values would have little opportunity to grow with the economy. Therefore, the 2000 figures were assumed to be valid for 2006.

The 2000 figures for traditional IRAs cannot, however, be used to represent contributions in a steady state because the Tax Reform Act of 1997 (TRA-97) called for the associated phaseout ranges to increase through 2007. At that time, a higher percentage of contributions would be deductible than was the case in 2000. To estimate the shift from nondeductible to deductible contributions that would result from further implementation of TRA-97, contributions in three income ranges were tabulated: those above the

[15] Peter J. Sailer and Sarah E. Nutter, "Accumulation and Distribution of Individual Retirement Arrangements, 2000," *SOI Bulletin,* vol. 23 (Spring 2004), pp. 121-134.

2000 phaseout floor but below the 2007 phaseout floor (expressed in 2000 dollars); those within the 2000 phaseout range; and those within the 2007 phaseout range (expressed in 2000 dollars). All nondeductible contributions in the first range were deemed to be deductible in the steady state. Furthermore, the ratio of deductible contributions to total contributions within the 2000 phaseout range was applied to nondeductible contributions in the 2007 phaseout range for an estimate of steady-state deductible contributions in that range. As a result, $246 million in contributions were shifted from the nondeductible to the deductible category (see Table 2).

Tabulations of Forms W-2 revealed that 401(k) deferrals were $117.3 billion in 2000. Most of those contributions were not made by participants constrained by the statutory limit, so the figure for 2000 was adjusted by using the projected growth of wages and salaries. That adjustment brought deferrals to $156.9 billion for 2006.

Extension of EGTRRA

The President's 2006 budget request called for the indefinite extension of most provisions of EGTRRA. The retirement savings provisions were not explicitly recommended for extension; rather, they were replaced by the LSA, RSA, and ERSA proposals. In the absence of those proposals, one could assume that an extension of EGTRRA would include the retirement savings provisions. The only exceptions would be the saver's credit (which expires in 2006) and the catch-up IRA contributions for people age 50 and older (which are not mentioned in the President's RSA proposal). The specific EGTRRA provisions analyzed here are the increases in IRA contribution limits, the increases in 401(k) contribution limits, and the allowance of "Roth 401(k)s" beginning in 2006.

IRA contribution limits. By increasing contribution limits, EGTRRA allows taxpayers to divert funds from taxable accounts to traditional IRAs (both as deductible and nondeductible contributions) and to Roth IRAs. Data from the Internal Revenue Service for 2002—the first year in which the higher contribution limits under EGTRRA applied—indicate that deductible IRA contributions increased by 27.8 percent between 2001 and 2002.[16] That increase is potentially attributable to three factors: (1) economic growth, (2) the changing phaseout ranges mandated by TRA-97, and (3) the higher contribution limits mandated by EGTRRA.

Because most IRA contributions under pre-EGTRRA law were at the $2,000 limit, economic growth could generate few additional contributions. Between 1987 and 1996, when the statutes governing IRAs were relatively stable, contributions to traditional IRAs actually declined. Therefore, none of the change between 2001 and 2002 has been attributed to economic growth.

The effect of TRA-97 was estimated by tabulating contributions below, within, and above phaseout ranges in a manner similar to the tabulations described earlier for pre-EGTRRA law. Only the change between 2001 and 2002 was estimated, however, instead of the entire change between 2000 and 2007. That analysis demonstrated that the change in deductible IRAs between 2001 and 2002 attributable to TRA-97 was negligible.

Thus, the entire 27.8 percent increase was attributable to EGTRRA. Extrapolating the behavior observed in 2002 to the steady state (when the contribution limit will be substantially higher than in 2002) implies an increase of $4.0 billion in deductible contributions and $1.2 billion in nondeductible contributions

[16]Internal Revenue Service, *Statistics of Income—2001: Individual Income Tax Returns* (January 2004), p. 45, and *Statistics of Income—2002: Individual Income Tax Returns* (December 2004), p. 50.

(see Table 3 for details). Of each of those figures, approximately 10 percent is attributable to catch-up contributions that would not carry through to the RSA proposal.

All of the increase in contributions to traditional IRAs under EGTRRA can be attributed to the 70 percent of participants who contributed the maximum allowable amount in 2000. In the absence of 2002 data on Roth contributions, it is reasonable to assume that the 62 percent of Roth participants who made the maximum allowable contribution in 2000 would have reacted to the increased limits under EGTRRA in the same way that participants in traditional IRAs did. Applying that assumption results in an estimate of $6.5 billion in additional contributions in the steady state as a result of EGTRRA.[17] Of that amount, approximately 3 percent is attributable to catch-up contributions that would not carry through to the RSA proposal.

401(k) contribution limits. At the time the calculations were preformed, no data on 401(k) contributions were available for any year after EGTRRA was enacted. Any increase in contributions deriving from EGTRRA, however, has presumably been limited to the 7 percent of participants contributing the maximum allowable amount in 2000. If that 7 percent contributed the same percentage of their income as those not constrained by the pre-EGTRRA limit (but did not contribute more than the EGTRRA limit), participants would have diverted an additional $2.3 billion from taxable accounts to front-loaded 401(k)s.[18] Of that amount, approximately 30 percent would be attributable to catch-up contributions.

[17] Alternatively, one could calculate an upper bound on the revenue loss resulting from EGTRRA by assuming that everyone at the pre-EGTRRA limit increases their contributions to the new limit. Under that assumption, the diversion of taxable assets to IRAs would break down as follows: $12.3 billion to traditional IRAs as deductible contributions, $3.7 billion to traditional IRAs as nondeductible contributions, and $15.8 billion to Roth IRAs.

[18] If that 7 percent of participants had all contributed the EGTRRA maximum, the corresponding diversion from taxable accounts would be $9.2 billion (in 2006 dollars).

Those figures cover only employee contributions. Contributions by employers are typically set as a percentage of employee contributions up to a maximum percentage of wages (most commonly, 50 percent of employee contributions up to 6 percent of wages). If the pre-EGTRRA limit on employee contributions was below the percentage-of-compensation limit on an employer's matching contributions, increasing the contribution limit would allow employers to increase their matching funds. If the typical matching percentage and cap were applied, additional employer contributions would amount to approximately $1.2 billion with 30 percent being attributable to catch-up contributions. Those funds cannot be assumed to have shifted directly from taxable accounts. Instead, it is assumed that they would have come directly out of taxable wages (thus reducing payroll taxes as well as income taxes) and that employees would reduce their taxable saving by a corresponding amount.

Roth 401(k) contributions under EGTRRA. Once back-loaded contributions to 401(k) plans are allowed, funds will come from two sources. First, some funds that would have been contributed to front-loaded 401(k)s will be diverted to back-loaded plans. Second, some funds will be shifted from taxable accounts. Using as a guide revenue estimates for the provision prepared by the Joint Committee on Taxation, the following amounts can be inferred for those shifts: $2.0 billion from front-loaded 401(k)s and $15.0 billion from taxable accounts.

Steady-State Revenue Cost of EGTRRA

Having estimated the shifts in contributions from one type of account to another resulting from EGTRRA, analysts then need only apply a change in the revenue yield rate to estimate the steady-state revenue cost of those EGTRRA provisions. Those RY rate changes have three distinct components: (1) that associated with shifting contributions from one type of account to another, (2) that associated with the general rate reductions in EGTRRA , and (3) that associated with avoiding payroll taxes. Values for

the first two components were calculated by subtracting the rate associated with the source tax system under pre-EGTRRA law from that associated with the destination tax system under EGTRRA. For example, the rate change to apply to a shift from a taxable account under pre-EGTRRA law to a front-loaded account under EGTRRA is calculated by subtracting 30.83 percent from 25.73 percent, for a difference of -5.10 percentage points (see Table 1A). The RY rate change associated with avoiding the payroll tax is just the employer's share of the payroll tax rate itself—7.65 percent. (Table 4 shows the estimated results for EGTRRA.)

5. Estimating Contributions to RSAs and LSAs

The RSA/LSA proposals for 2006 contain several provisions that are grouped together for analytical purposes as follows:

1. Allowing existing balances in traditional IRAs to be converted to RSAs;
2. Disallowing new contributions to traditional IRAs and disallowing catch-up contributions; and
3. Establishing LSAs and accelerating the indexing of the RSA contribution limit.

This part of the analysis initially assumes that the baseline for measuring effects is permanent EGTRRA law. At the end, the analysis adds the EGTRRA provisions that carry over to RSAs and ERSAs to estimate the steady-state revenue loss relative to indexed current law.

Allow the Conversion to RSAs of Existing Balances in Traditional IRAs

Converting front-loaded accounts to back-loaded accounts is a new option only for participants with AGI over $100,000; other participants already have the option to convert to a Roth IRA under current law. Even among the newly eligible, IRA owners would convert their accounts only if they expected their

marginal tax rate to increase after they retired or if they had sufficient taxable assets or current income available to pay the tax due upon conversion.

The ability to pay the tax due upon conversion out of taxable assets or current income is important because it effectively allows participants to make a contribution to the RSA that does not count against the annual limits. If the tax was paid out of the IRA principal, then the amount deposited in the RSA would be less than the amount that had been in the IRA. But the RSA would still eventually have the same value to the participant as the IRA had (unless tax rates changed). Paying the tax without reducing the IRA principal is the equivalent of contributing the amount of the tax to the RSA. That extra contribution would increase the value of the RSA relative to the IRA.

Because of the accompanying ability to prorate the tax over four years, virtually all owners of traditional IRAs with the inclination to convert would do so in the first year. The short-term revenue effect would eventually run its course, and the balance in RSAs as a result of conversions would reach zero. Hence, the steady-state effect on revenues from conversions of funds already in a front-loaded IRA would be zero. Any ongoing conversions would be the result of rollovers from front-loaded 401(k)s. To the extent that those rollovers were funds already in front-loaded accounts, the conversions would eventually run their course, and the steady-state effect would be zero.

Disallow New Contributions to Traditional IRAs and Disallow Catch-Up Contributions

Under the RSA/LSA proposal, all contributions that would have gone into traditional IRAs, whether deductible or nondeductible, must be directed elsewhere. Because such contributors are demonstrably willing to make long-term investments and probably have other means by which to fill their LSAs, this analysis assumes that those contributions—up to the $5,000 limit—would go to RSAs. The analysis also

assumes that the funds have been diverted from either front-loaded or partially back-loaded accounts (that is, those funded with nondeductible contributions) in proportion to those accounts' shares of total contributions in 2000. "Catch-up contributions" made by participants age 50 and older under EGTRRA, cannot be made to RSAs under the proposal. Instead, they are treated as short-term saving and assumed to be directed to LSAs.

In cases in which participants made deductible contributions that were below the statutory maximum, the amount shifted to RSAs would be less than the amount contributed to IRAs because the difference would be used to pay the tax. Most participants who reached the limit of their deductible contributions would pay the tax out of existing taxable assets or current income and thus contribute the same amounts to RSAs as they would have contributed to IRAs. Finally, in cases in which the IRA contributions were nondeductible, the amounts contributed to RSAs would be the same as the amounts contributed to IRAs.

Conversions from front-loaded IRAs to back-loaded RSAs would increase revenues in the short term as people paid tax on the converted balances. Over the long term, however, revenues would be lower than otherwise as funds that previously would have been taxable were withdrawn and consumed. Furthermore, some taxes on investment income would be lost as the underlying assets were liquidated to pay the tax due upon conversion. As stated earlier, the present values of the long-term losses and the short-term gains offset one another as long as tax rates do not change. That conclusion, however, implicitly incorporates the assumption that the tax due upon conversion will be paid out of the assets being converted. Because some of the tax would be paid out of taxable assets, the present value of the long-term losses would exceed that of the short-term gains.

The diversion of contributions from traditional IRAs would have three components in the steady state relative to permanent EGTRRA law: (1) the effect of a pure diversion of deductible contributions to RSAs or LSAs, with the tax reducing the amount diverted; (2) the effect of any additional contributions to the RSA or LSA accomplished by paying the tax out of taxable assets or current income; and (3) the effect of diverting nondeductible contributions to RSAs or LSAs. Each component must also be split between the long-term savings diverted to RSAs and the short-term savings diverted to LSAs. The long-term portions of the first and third components were estimated earlier, in conjunction with the baselines, at $11.4 billion and $3.4 billion, respectively. The short-term portions were estimated at $0.4 billion and $0.1 billion, respectively. The 20 percent tax was assumed to have been paid out of taxable assets for 43 percent of deductible contributions—the percentage contributed by those at the EGTRRA contribution limit. The remainder of the tax was assumed to have reduced the amount diverted to the RSA.

Establish LSAs and Accelerate Indexing of the RSA Contribution Limit

The LSA and RSA contribution limit provisions, estimated jointly, would probably affect the behavior of owners of taxable assets, 401(k) participants, and certain small employers with retirement plans. Specifically:

- Owners of taxable assets would seek to shift those assets into LSAs or RSAs;
- Some 401(k) participants would divert a portion of their contributions to LSAs; and
- Some small employers would terminate their retirement plans and pay their workers higher cash wages, which many would deposit in LSAs and RSAs.

Shift assets from taxable accounts. Unless transaction costs discouraged it, taxpayers would first transfer their "shiftable" assets from short-term taxable accounts into LSAs for each adult in the family

up to the maximum allowable each year until they ran out of assets.[19] Some might choose to fund LSAs for their children as well. In this analysis, funds were shifted from taxable accounts to RSAs only after the LSA limits had been hit for all family members. Because the EGTRRA limits for Roth IRAs differ from those of the RSA only in the effective date of indexing and (as explained earlier) a steady-state estimate assumes that indexing is always in place, the only measurable opportunity to shift funds from taxable accounts to an RSA is the extent to which the real value of the indexed limits differs in the reference year of 2006.

The shifting of assets from taxable accounts to LSAs and RSAs would lose revenues in both the short and long terms as investment income that was previously taxable moved into sheltered accounts. Participants with sufficient shiftable assets (roughly $100,000 per family member) would be able to fund LSAs and RSAs out of the investment returns on those taxable assets and would not have to draw down their principal. Everybody else, however, would eventually exhaust their shiftable assets and either cease contributing or contribute out of earned income.

There is a steady-state loss associated with participants who could fund LSAs and RSAs out of their taxable investment income and those who would fund LSAs and RSAs out of their earned income. The estimate was done in two parts—one for LSAs with a life cycle of 12 years and one for RSAs with a life cycle of 25 years.

[19]Each person would have a different perception of what assets could be shifted. For modeling purposes, shiftable assets are defined as all liquid and interest-bearing assets, 20 percent of stocks (roughly reflecting annual turnover of stocks), 25 percent of housing equity (reflecting the ability to contribute out of the proceeds of a home-equity loan), and 10 percent of "other financial assets."

The amount that would be contributed to LSAs is highly uncertain and the subject of controversy. Most estimates have focused on how much investment income would be exempted but without explicit reference to the amount contributed. Using a model based on the 2001 Survey of Consumer Finances, this analysis estimated as an upper bound that the percentage of assets in taxable accounts would drop from 50 percent to 37 percent over the long term.[20] Under the assumption that the rate of return does not vary between account types, that estimate implied that taxable investment returns would decline by 26 percent (i.e., [50-37]/50). Generating that level of investment income in LSAs would require annual contributions of $461.6 billion.

The amount that would be contributed to RSAs is less uncertain because it is limited to $350 per worker—the amount by which the RSA limit exceeds the fully-phased-in contribution limit for Roth IRAs under EGTRRA. As an upper bound, this analysis assumed that all taxpayers at the IRA limit under EGTRRA would contribute the full $350 to an RSA, resulting in an estimated shift of $3.7 billion.

Divert employee contributions from 401(k)s to LSAs. Once they had exhausted their shiftable assets, some taxpayers who contribute to a 401(k) would divert a portion of those contributions to an LSA. By doing so, they would eliminate the risk of incurring a penalty tax upon withdrawal of funds. Because most employee contributions to 401(k)s trigger an employer match, however, the amount diverted would probably be limited to amounts not eligible for such a match. Furthermore, taxpayers who expected their tax rates to drop after retirement might be better off staying with the front-loaded 401(k) even in the

[20]Those results represent an upper bound because they incorporate the assumption that saving is a fixed percentage of income. If, as empirical evidence indicates, saving as a percentage of income was smaller (or even zero or negative) for low-income families, then their contributions to LSAs would be lower. Higher-income families, in contrast, would save a larger percentage of their income, but their LSA contributions would be constrained by the $5,000 limit. The net effect, therefore, would be lower aggregate contributions.

absence of an employer match. Because back-loaded 401(k)s will become available in 2006, there is no reason to divert contributions to an RSA just to get the advantages of a back-loaded plan.

The revenue effects of that aspect of the proposal are similar to those of the diversion of IRA contributions to RSAs. Taxpayers would forgo a deduction in the short term—thereby increasing near-term revenue—but would not pay tax on withdrawals. In the long run, the forgone tax on withdrawals would dominate, and the revenue effect would be negative. Furthermore, people who had reached the statutory limit of their contributions would probably be able to pay the additional up-front tax out of taxable resources, thus increasing the value of the LSA compared with that of the 401(k). The present value of the long-term revenue losses would therefore exceed that of the short-term revenue gains.

Because 401(k)s will continue to exist (as ERSAs), the diversion of contributions will be ongoing and a steady-state impact can be estimated. That estimate has two components: (1) the effect of a pure diversion of deductible contributions, with the tax reducing the amount contributed to the LSA, and (2) the effect of any additional contributions to the LSA derived from paying the tax out of taxable assets or current income.[21] The former was estimated at $48.5 billion by tabulating 401(k) contributions in excess of 6 percent of wages on the 2001 Survey of Consumer Finances—the typical maximum amount eligible for an employer match. As an upper bound, all of the taxes on the conversions (at a 20 percent rate) were assumed to be paid out of taxable assets.

Divert employer contributions from employment-based plans to LSAs and RSAs. Some employers would terminate their retirement plans in response to this proposal, figuring that their employees could

[21] Although LSAs would probably have shorter holding periods than do 401(k)s, the long-term saving cycle must be retained in this case to avoid changing gross domestic product (GDP).

save just as much for retirement and receive equivalent tax benefits using LSAs and RSAs but without having to incur the same administrative costs that the employers do. Instead of contributing to the retirement plan, employers would pay out the equivalent amount (including administrative cost savings) as taxable wages. Importantly, that form of compensation would also be subject to payroll taxes. Employees would invest the additional after-tax wages in LSAs first, then in RSAs—once the LSAs had been fully funded. If they reached the limit on contributions for both types of plan, however, they would have to invest the remaining amount in taxable assets.

The fundamental revenue effect associated with voluntary diversions of 401(k) contributions is also applicable to this aspect of the proposal, namely, that taxpayers would forgo a deduction in the short term—thereby increasing near-term revenue—but would not pay tax on withdrawals. To the extent that some taxpayers would have to invest a portion of their additional compensation in taxable assets, however, the long-term revenue effect would be positive, because the investment income would become taxable immediately. The new payroll taxes also represent an increase in revenue over the long term. Although some taxpayers could still pay the taxes due out of existing taxable assets, thereby increasing the value of their LSAs and RSAs compared with the value of their employment-based plans, the payroll tax ensures that the long-term revenue effect will be positive in present value terms.[22]

Although the termination of employment-based plans would be a one-time event, the effect of redirecting the amount that employers would have contributed would be ongoing. As a result, a steady state will be reached. This aspect of the proposal is the most difficult to gauge, however, because there is no good way of estimating how many plans would terminate. As an upper bound, the analysis assumed that all

[22]Ultimately, the higher payroll taxes would increase the taxpayer's Social Security benefits. This analysis ignores that effect.

private defined-benefit plans with fewer than 100 participants in 1997 would terminate in response to the RSA/LSA provision, that 80 percent of the new wages would be reinvested in LSAs, and that none of the tax due would reduce saving that would otherwise have been directed to taxable accounts. The resulting estimate has three components: (1) the income tax effect of diverting new wages to an LSA, with the tax reducing the amount contributed; (2) the income tax effect of diverting new wages to a taxable account (because the LSA caps have been reached), with the tax reducing the amount contributed; and (3) the payroll tax effect of receiving the compensation as wages. Based on Forms 5500 filed in 1997, the employer contributions diverted from terminated plans would be approximately $5.3 billion; the analysis assumed that $4.3 billion would go to LSAs and the rest would go to taxable accounts.[23]

Combined Steady-State Revenue Costs

Relative to a permanent EGTRRA baseline, a change in the revenue yield rate to the various flows estimated above yields an annual steady-state revenue cost of $17.0 billion (see Table 5). Over 90 percent of that sum results from the diversion of taxable assets into LSAs. Relative to indexed current law, the steady-state revenue loss would be $2.8 billion higher, or $19.9 billion. That steady-state revenue cost differs sharply from estimates of the budgetary effects within a short-term window.[24]

6. Sensitivity Analysis

The above results are quite sensitive to the values of various parameters. Among those are the duration of savings, real wage growth, the real rate of return on investments, and the tax rate on investment income. Each parameter was tested in isolation, using—except in the case of duration of savings—a

[23]Although LSAs and taxable accounts would typically have shorter holding periods than private defined-benefit plans, the 20-year assumption must be retained in this case to avoid changing GDP.

[24]For example, the Joint Committee on Taxation estimated that the revenue loss from the President's 2006 proposals would be $5.2 billion in the 10th year of the budget window, less than one-third of the steady-state annual revenue loss.

plausible extreme for either the high or low value and a symmetric parameter adjustment to represent the other extreme. The results generally fell within $10 billion, plus or minus, of the base estimate, with the relationship between steady-state revenue cost and each parameter value being linear or nearly so.

Duration of Savings

The base case assumed that retirement savings accounts would have a 25-year life cycle and all other saving would have a 12-year life cycle. If, instead, all saving had a 12-year life cycle, the steady-state revenue cost of the RSA/LSA proposal would be $16.2 billion—only $0.8 billion less than under the base case (see Table 6). The difference is small because the steady-state revenue cost is dominated by the LSA component, which is assumed to have a 12-year life cycle under the base case. In contrast, if all saving had a 25-year life cycle, the steady-state revenue cost of the RSA/LSA proposal would be $33.5 billion—nearly double the revenue loss under the base case. Other values were not simulated; however, if all savings are assumed to have the same life cycle, the steady-state revenue cost appears to be a nearly linear function of the length of that cycle, although the increase in revenue cost may decelerate slightly as the cycle lengthens.

Real Wage Growth

The base case assumed that real wage growth was 2.1 percent, and the rate of return was 1.2 percentage points greater than that. To put a floor under plausible estimates, the steady-state revenue loss was simulated by assuming no real wage growth. The real rate of return was assumed to be 1.2 percent, thereby maintaining the same difference between wage growth and the rate of return as in the base case. Under those assumptions, the steady-state revenue cost of the RSA/LSA proposal was $6.8 billion. A symmetric parameter adjustment to simulate a higher growth rate than that of the base case yielded real wage growth of 4.2 percent and a rate of return of 5.4 percent. Under those assumptions, the steady-state

revenue cost of the RSA/LSA proposal was $27.2 billion. On the basis of the three data points simulated, the steady-state revenue cost appears to be a linear function of real wage growth.

Real Rate of Return

The base case assumed that the real rate of return on investments was 3.3 percent—1.2 percentage points higher than real wage growth. To put a floor under plausible estimates, the steady-state revenue loss was simulated by assuming that the real rate of return was equal to real wage growth (that is, 2.1 percent). Under that assumption, the steady-state revenue cost of the RSA/LSA proposal was $9.5 billion. A symmetric parameter adjustment to simulate a higher rate of return than that of the base case yielded a real rate of return of 4.5 percent—2.4 percentage points greater than real wage growth. Under that assumption, the steady-state revenue cost of the RSA/LSA proposal was $25.3 billion. The relationship between the steady-state revenue cost and the rate of return seems to be somewhat less linear than that between the steady-state cost and real wage growth. The increase in the steady-state revenue cost seems to accelerate slightly as the rate of return increases.

Tax Rate on Investment Income

The base case assumed that EGTRRA would not be extended and that the tax rate on investment income outside of nontaxable accounts was 16 percent. To put a ceiling over plausible estimates, the steady-state revenue loss was simulated by assuming that the tax rate was the same as that on contributions and withdrawals—22 percent. Under that assumption, the steady-state revenue cost of the RSA/LSA proposal was $26.9 billion. A symmetric parameter adjustment to simulate a lower tax rate than that of the base case yielded a tax rate of 10 percent. Under that assumption, the steady-state revenue cost of the RSA/LSA proposal was $6.7 billion. Under the assumption that EGTRRA was extended, a high tax rate of 20 percent and a low tax rate of 4 percent were used for the portion of the analysis representing the

extension. The steady-state revenue costs under those scenarios were $30.7 billion and $8.6 billion, respectively. On the basis of those simulations, it appears that the increase in the steady-state revenue loss decelerates very slightly as the tax rate on investment income increases.

Figure 1
Revenue Losses of Front- and Back-Loaded Systems of Taxing Saving

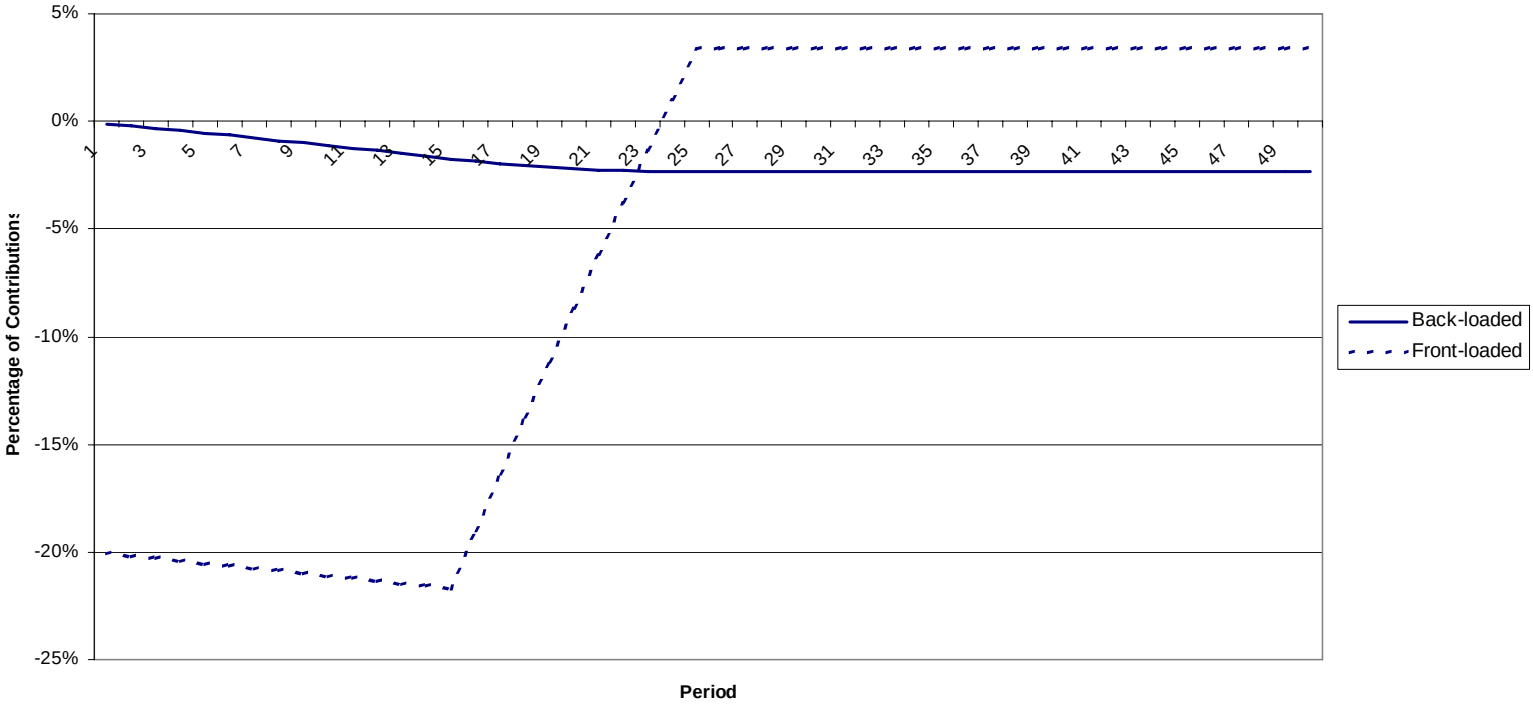

Table 1A.

Steady-State Revenue Yield Rates by Length of Saving Cycle, Tax Law, and Savings Taxation System

	Indexed Current Law		Permanent EGTRRA	
	Short-term	Long-term	Short-term	Long-term
Taxable	26.29	30.83	23.32	26.88
Front-loaded	25.11	28.30	22.82	25.73
Back-loaded	22.00	22.00	20.00	20.00
Partially back-loaded	27.49	32.56	25.11	29.85

Source: CBO microsimulation model of individual income taxes and staff calculations.

Table 1B.

Changes in Steady-State Revenue Yield Rates Resulting from Different Savings Taxation Systems by Length of Saving Cycle and Tax Law

	Indexed Current Law		Permanent EGTRRA	
	Short-term	Long-term	Short-term	Long-term
Taxable to front-loaded	-1.19	-2.53	-0.05	-1.15
Taxable to back-loaded	-4.29	-8.83	-3.32	-6.88
Taxable to partially back-loaded	1.19	1.73	1.79	2.96
Partially back-loaded to front-loaded	-2.38	-4.25	-2.29	-4.11
Partially back-loaded to back-loaded	-5.49	-10.56	-5.11	-9.85
Front-loaded to back-loaded	-3.11	-6.30	-2.82	-5.73

Source: CBO staff calculations.

Table 2.

Pre-EGTRRA IRA Contributions Adjusted for Changes Mandated by the Tax Reform Act of 1997 (Billions of dollars)

	Deductible	Nondeductible	Roth
Actual 2000 contributions	7.5	2.6	11.6
Steady-state contributions	7.7	2.3	11.6

Sources: SOI and CBO staff calculations.

Table 3.

IRA Contributions Under EGTRRA Limits (Billions of dollars)

	Deductible	Nondeductible	Roth
Regular contributions			
Pre-EGTRRA contributions	7.7	2.3	11.6
Fully-phased-in EGTRRA contributions	11.4	3.4	17.8
Amount shifted from taxable accounts	3.7	1.1	6.3
Catch-up contributions			
Pre-EGTRRA contributions	0	0	0
Fully-phased-in EGTRRA contributions	0.4	0.1	0.2
Amount shifted from taxable accounts	0.4	0.1	0.2
All contributions			
Amount shifted from taxable accounts	**4.0**	**1.2**	**6.5**

Sources: SOI and CBO staff calculations.

Table 4.

Steady-State Cost of the Retirement Provisions of EGTRRA Relative to Indexed Current Law

	Direction of Flow[a]	Revenue Yield Rate Change (Percent)	Amount Shifted in Steady State (Billions of dollars)	Revenue Change (Billions of dollars)
Increase IRA contribution limits				
Additional deductible contributions	T-F	-5.1	3.7	-0.2
Additional nondeductible contributions	T-P	-1.0	1.1	*
Additional Roth contributions	T-B	-10.8	6.3	-0.7
Allow catch-up contributions to IRAs				
Deductible catch-up contributions	T-F	-3.5	0.4	*
Nondeductible catch-up contributions	T-P	-1.2	0.1	*
Roth catch-up contributions	T-B	-6.3	0.2	*
Increase 401(k) contribution limits				
Additional employee contributions	T-F	-5.1	1.7	-0.1
Additional employer contributions (No longer subject to FICA)	T-F	-12.8	0.8	-0.1
Allow catchup contributions to 401(k)s				
Employee catch-up contributions	T-F	-3.5	0.7	*
Employer matches of catch-up contributions (No longer subject to FICA)	T-F	-11.1	0.3	*
Allow back-loaded 401(k)s				
Deductible contributions diverted to Roth 401(k)s	F-B	-8.3	2.0	-0.2
New contributions from taxable assets	T-B	-10.8	15.0	-1.6
Total				**-2.9**

Source: CBO staff calculations.

Note: * = less than $0.05 billion.

a. F-B = front-loaded to back-loaded; T-F = taxable to front-loaded; T-B = taxable to back-loaded; T-P = taxable to partially back-loaded.

Table 5.

Steady State Cost of the President's 2006 RSA/LSA Proposal Relative to Permanent EGTRRA Law

	Direction of Flow[a]	Duration of Saving[b]	Revenue Yield Rate Change (Percent)	Amount Shifted in Steady State (Billions of dollars)	Revenue Change (Billions of dollars)
Allow balances in traditional IRAs to be converted to RSAs	F-B	Long	-5.7	0.0	-0.0
Disallow traditional IRAs					
Deductible IRAs diverted to RSAs	F-B	Long	-5.7	11.4	-0.7
Deductible IRA catch-up contributions diverted to LSAs	F-B	Short	-2.8	0.4	*
Tax paid on diverted IRAs	T-B	Long	-6.9	1.0	-0.1
Tax paid on diverted catch-up contributions	T-B	Short	-3.3	*	*
Nondeductible IRAs diverted to RSAs	P-B	Long	-9.9	3.4	-0.3
Nondeductible IRA catch-up contributions diverted to LSAs	P-B	Short	-5.1	0.1	*
Establish LSAs and accelerate indexing of RSAs					
Taxable assets shifted into LSAs	T-B	Short	-6.9	461.6	-15.3
Taxable assets shifted into RSAs	T-B	Long	-3.3	3.7	-0.3
Employee 401(k) contributions diverted to RSAs	F-B	Long	-5.7	3.1	-0.2
Tax paid on diverted 401(k)s	T-B	Long	-6.9	0.6	*
Employer contributions to small defined-benefit plans diverted to RSAs	F-B	Long	-5.7	4.3	-0.2
Employer contributions to small defined-benefit plans diverted to taxable wages (Subject to FICA)	F-T	Long	8.8	1.1	0.1
Total					**-17.0**
Total relative to indexed current law					**-19.9**

Source: CBO staff calculations.

Note: * = less than $0.05 billion.

a. F-B = front-loaded to back-loaded; T-B = taxable to back-loaded; P-B = partially back-loaded to back-loaded; F-T = front-loaded to taxable.

b. Short = eight years contributing, four years withdrawing; long = 15 years contributing, 10 years withdrawing.

Table 6.

Sensitivity Tests of Steady-State Costs (Billions of dollars)

	President's 2006 RSA/LSA Proposal	RSA/LSA Proposal with EGTRRA Extension
Base case	17.0	19.9
Savings duration (Base case: LSAs on 12-year cycle, RSAs on 25-year cycle)		
All short-term (12-year cycle)	16.2	17.9
All long-term (25-year cycle)	33.5	36.3
Real wage growth (Base case: 2.1 percent)		
Low (None)	6.8	8.2
High (4.2 percent)	27.2	31.5
Real rate of return (Base case: 3.3 percent)		
Low (2.1 percent—same as real wage growth)	9.5	11.6
High (4.5 percent)	25.3	29.1
Tax rate on investment income (Base case: 16 percent; EGTRRA extension: 12 percent)		
Low (10 percent, 4 percent)	6.7	8.6
High (22 percent, 20 percent—equal to rate on contributions and withdrawals)	26.9	30.7

Source: CBO staff calculations.

Appendix: Algebraic Rendition of Steady-State Model

In the absence of taxes, a model of asset accumulation in a retirement account is straightforward. The basic model is expressed as a cycle involving contributions made in a single year, held for a fixed period, and then withdrawn over another fixed period. Each year in the cycle is represented by a value of t. Contributions made in subsequent years are added at a later stage, and those contributions will go through a similar cycle. Each such cycle will be represented by a value of s.

Participants make contributions (C) in the initial year ($t = 1$), and those funds remain untouched for a period of T' years. Participants then withdraw their assets in equal installments (W) such that their account balances are zero after T years. Assets in the accounts accrue investment returns (I) at an annual rate of ρ. Thus, assets in a given year during the cycle (A_t, where $t \leq T$) can be rendered as follows:

(1) $A_t = (A_{t-1}+C_t)\times e^{\rho} - W_t\times(e^{\rho}-1)/\rho$, where

$$C_t = \begin{cases} 1 \text{ if } t = 1 \text{ (this is the numeraire),} \\ 0 \text{ if } t > 1 \text{ (no contributions are made after the first year),} \end{cases}$$

$W_t = 0$ if $t \leq T'$ (withdrawals begin in year $T'+1$),

$W_{T'+1} = W_{T'+2} = W_{T'+3} = \ldots = W_T$ (withdrawals are made in equal installments), and

$A_t = 0$ if $t = T$ (the account is exhausted in year T).

Investment returns, an important factor in calculating associated revenues, are simply the residual increase in assets after contributions and withdrawals have been considered:

(2) $I_t = (A_t - A_{t-1}) - C_t + W_t$.

Each subsequent year (s) sees the beginning of a new cycle and a new set of contributions, which are assumed to be larger than the previous year's contributions by a factor of $1 + \gamma$. Those contributions, the

investment income they earn, and their eventual withdrawal must be incorporated into the model. The steady state is reached once the first cycle is completed, but the revenue stream at that point depends on all cycles that are under way.

More specifically, over the first T' years, total assets grow in every year as contribution cycles are added. In year $T' + 1$, however, assets associated with the first cycle decline due to withdrawals, and in each subsequent year assets associated with another cycle begin to decline. In year T, assets associated with T' cycles increase, but those associated with $T - T'$ cycles decrease. This represents the model's steady state, and the same number of increasing and decreasing cycles will occur in each subsequent year. Generalizing from equation 1, the steady state in year T can be rendered as follows:

$$(3) \qquad A_T = \left(A_{T-1} + C_T\right)e^{\rho} - \sum_{s=1}^{T-T'} W_{s,T}\left(e^{\rho} - 1\right)/\rho$$

Introducing taxes complicates the model to varying degrees, depending on how any tax incentives are structured. Of ultimate interest is the revenue yield associated with a given amount of pretax contributions. Revenue is generated by the flows (C, W, and I), not by the assets themselves, so the value of A per se is of no direct interest. C (grossed up for taxes paid) is the numeraire, so only the values of W and I remain to be rigorously defined.

Accounts with Back-Loaded Tax Incentives

The simplest tax regime is the back-loaded account in which contributions are made out of after-tax income. Investment income and withdrawals are entirely tax-free under such a regime, making it unnecessary to solve for either W or I. Revenue (R_T) under such a system would be strictly a function of the level of contributions and the regular tax rate (τ_r) as follows:

(4) $R_T = \tau_r \times C_T /(1-\tau_r)$.

In all periods, including the steady state, the ratio of revenues to pretax contributions is equal to the regular tax rate:

(5) $R_T/[C_T /(1-\tau_r)] = \tau_{r.}$

Accounts with Front-Loaded Tax Incentives

Somewhat more complicated are accounts with front-loaded tax incentives—that is, where contributions are made from pretax income and investment returns accrue tax-free but withdrawals are fully taxable. In that case, revenues are a function of withdrawals and the regular tax rate as follows:

(6) $R_T = \tau_r \times \sum_{s=1}^{T-T'} W_{s,T.}$

To express revenue per dollar contributed entirely in terms of the model's parameters requires a fuller specification of contributions and withdrawals, but investment income does not play a role (see equations 7 and 8):

(7) $C_s = (1+\gamma)^s$.

(8) $W_{s,T} = C_s \times \rho e^{\rho T'}/[1-e^{-\rho(T-T')}]$, for $s = 1,T-T'$.

Making the appropriate substitutions renders the following:

(9) $R_T/C_T = \tau_r \times[\sum_{s=1}^{T-T'} (1+\gamma)^s] \times \rho e^{\rho T'}/[(1+\gamma)^T \times (1-e^{-\rho(T-T')})]$.

Fully Taxable Accounts

Fully taxable accounts are yet more complicated. Revenues from such accounts are a function not only of contributions and τ_r but also of investment income ($I_{s,t}$) and the tax rate thereon (τ_i), as follows:

$$(10) \qquad R_T = [\tau_r \times C_T /(1-\tau_r)] + [\tau_i \times \sum_{s=1}^{T} I_{s,T} /(1-\tau_i)].$$

This time, it is necessary to fully specify contributions, withdrawals, and investment income in order to render the revenues per dollar contributed entirely in terms of the model's parameters (equations 11 to 13).

$$(11) \qquad C_s = (1-\tau_r)\times(1+\gamma)^s .$$

$$(12) \qquad W_{s,T} = \begin{cases} C_s \times \rho(1-\tau_i)e^{\rho(1-\tau_i)T'} \Big/ \left[1-e^{-\rho(1-\tau_i)(T-T')}\right], \text{if } s = 1, T-T' \\ 0, \text{if } s = T-T'+1, T. \end{cases}$$

$$(13) \qquad I_{s,T} = \begin{cases} C_s \times \left\{ e^{\rho(1-\tau_i)(T-s+1)} - e^{\rho(1-\tau_i)(T-s)} - \left(W_{s,T} / C_s\right) \times \left[\left(e^{\rho(1-\tau_i)(T-s-T'+1)} - e^{\rho(1-\tau_i)(T-s-T')} \right) \Big/ \rho(1-\tau_i) - 1 \right] \right\}, \\ \text{if } s = 1, T-T' \\ C_s \times \left[e^{\rho(1-\tau_i)(T-s+1)} - e^{\rho(1-\tau_i)(T-s)} \right], \\ \text{if } s = T-T'+1, T. \end{cases}$$

Making the appropriate substitutions renders the following:

$$(14) \qquad R_T/C_T = \tau_r + [(1-\tau_r)\tau_i /(1-\tau_i)] \times \left\{ \sum_{s=T-T'+1}^{T} [e^{\rho(1-\tau_i)(T-s+1)} - e^{\rho(1-\tau_i)(T-s)}]/(1+\gamma)^{T-s} + \right.$$
$$\left. \sum_{s=1}^{T-T'} \{e^{\rho(1-\tau_i)(T-s+1)} - e^{\rho(1-\tau_i)(T-s)} - [e^{\rho(1-\tau_i)T'}/(1-e^{-\rho(1-\tau_i)(T-T')})] \times [(e^{\rho(1-\tau_i)(T-T'-s+1)} - e^{\rho(1-\tau_i)(T-T'-s)} - \rho(1-\tau_i)]\}/(1+\gamma)^{T-s} \right\}.$$

Results

The analysis assumes two different sets of values for T' and T—that is, 15 and 25 years, respectively, for assets saved for retirement and eight and 12 years, respectively, for all other assets. On the basis of CBO's economic forecast released in January 2005, γ was set at 0.021 (real wage growth), and ρ was set at 0.033 (the real interest rate on 10-year Treasury bonds). Two different sets of tax rates were used based on CBO's individual income tax microsimulation model: one corresponding to the assumption that EGTRRA provisions are extended indefinitely and the other corresponding to the assumption that those provisions expire as scheduled. Under the extension assumption, the tax rate on contributions and withdrawals (τ_r) was set at 20 percent, and the tax rate on investment returns (τ_i) was set at 12 percent. Under the expiration assumption, the rates were set at 22 percent and 16 percent, respectively. The resulting revenues in year T as a percentage of amounts contributed in that year are shown in Table 1A. The differences between those values determine the revenue effect of shifting a dollar from one type of account to another. The different possibilities investigated in the paper are shown in Table 1B.

Sensitivity Tests

As discussed in the body of the paper, some of the results of this analysis are sensitive to the rate of real wage growth, the real rate of return on investments, and the tax rate on investments. To perform the sensitivity test, steady-state revenue yield rates were calculated for each scenario using the above equations.

To test the sensitivity to wage growth, values of 0.0 and 0.042 were used for γ. The difference between ρ and γ was maintained at .012 in both of those tests. Revenue yield rates ranged between 20 percent for back-loaded plans under EGTRRA to 36.67 percent for partially back-loaded plans with a 25-year cycle under pre-EGTRRA law and the higher growth rate (see Table A-1). The results for back-loaded

accounts do not change with γ, and the results for front-loaded accounts change very little in response to a change in γ. The results for taxable accounts and partially back-loaded accounts, in contrast, change significantly. Thus, the revenue effect of diverting funds from taxable accounts to either front- or back-loaded accounts is quite sensitive to changes in real wage growth.

To test the sensitivity to the rate of return, values of 0.021 and 0.045 were used for ρ while holding γ at 0.021. The former represents a case in which the rate of return exactly equals wage growth; the latter represents a case in which returns higher than the risk-free rate are realized over the long term, as many argue would occur if funds were invested primarily in stocks. Revenue yield rates ranged between 20 percent for back-loaded plans under EGTRRA to 38.42 percent for partially back-loaded plans with a 25-year cycle under pre-EGTRRA law and the higher rate of return (see Table A-2). Again, the revenue yield from back-loaded accounts remains unchanged. In contrast, that from front-loaded accounts proves to be much more sensitive to ρ than to γ. Taxable accounts and partially back-loaded accounts respond to changes in ρ in much the same way as they respond to changes in γ.

To test the sensitivity to the tax rate on investment, alternative values of τ_i were tested while holding τ_r at 22 percent (20 percent for the extension of EGTRRA). At the high extreme, τ_i was set equal to τ_r. The symmetrical value at the low extreme was 10 percent (4 percent for the extension of EGTRRA). Because only the taxable accounts involve the contemporaneous taxation of investment income, that is the only type of account whose results are sensitive to that parameter (see Table A-3).

Table A-1.

Steady-State Revenue Yield Rates Under Different Rates of Real Wage Growth

	Indexed Current Law			Permanent EGTRRA		
	Low growth (0 percent)	Base case (2.1 percent)	High growth (4.2 percent)	Low growth (0 percent)	Base case (2.1 percent)	High growth (4.2 percent)
Short Term						
Taxable	23.57	26.29	28.98	21.21	23.32	25.43
Front-loaded	24.80	25.11	25.52	22.55	22.82	23.20
Back -loaded	22.00	22.00	22.00	20.00	20.00	20.00
Partially back-loaded	24.19	27.49	30.26	22.04	25.11	27.70
Long Term						
Taxable	25.31	30.83	36.09	22.56	26.88	31.07
Front-loaded	27.95	28.30	28.89	25.41	25.73	26.27
Back-loaded	22.00	22.00	22.00	20.00	20.00	20.00
Partially back-loaded	26.64	32.56	36.67	24.33	29.85	33.68

Source: CBO staff calculations.

Table A-2.

Steady-State Revenue Yield Rates Under Different Real Rates of Return on Investments

	Indexed Current Law			Permanent EGTRRA		
	Low rate (2.1 percent)	Base case (3.3 percent)	High rate (4.5 percent)	Low rate (2.1 percent)	Base case (3.3 percent)	High rate (4.5 percent)
Short Term						
Taxable	24.60	26.29	28.16	22.01	23.32	24.78
Front-loaded	22.28	25.11	28.29	20.25	22.82	25.72
Back -loaded	22.00	22.00	22.00	20.00	20.00	20.00
Partially back-loaded	25.28	27.49	29.97	23.06	25.11	27.43
Long Term						
Taxable	27.09	30.83	35.33	23.95	26.88	30.44
Front-loaded	22.33	28.30	35.84	20.30	25.73	32.58
Back-loaded	22.00	22.00	22.00	20.00	20.00	20.00
Partially back-loaded	27.92	32.56	38.42	25.52	29.85	35.31

Source: CBO staff calculations.

Table A-3.

Steady-State Revenue Yield Rates Under Different Tax Rates on Investment Income

	Indexed Current Law			Permanent EGTRRA		
	Low rate (10 percent)	Base case (16 percent)	High rate (22 percent)	Low rate (4 percent)	Base case (12 percent)	High rate (20 percent)
Short Term						
Taxable	24.71	26.29	27.85	21.12	23.32	25.47
Front-loaded	25.11	25.11	25.11	22.82	22.82	22.82
Back -loaded	22.00	22.00	22.00	20.00	20.00	20.00
Partially back-loaded	27.49	27.49	27.49	25.11	25.11	25.11
Long Term						
Taxable	27.63	30.83	33.91	22.36	26.88	31.17
Front-loaded	28.30	28.30	28.30	25.73	25.73	25.73
Back-loaded	22.00	22.00	22.00	20.00	20.00	20.00
Partially back-loaded	32.56	32.56	32.56	29.85	29.85	29.85

Source: CBO staff calculations.