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TRENDS AND ISSUES
Tax-Efficient Sequencing
Of Accounts to Tap in Retirement

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EXECUTIVE SUMMARY

This study discusses strategies for selecting the sequence of withdrawing funds from savings vehicles during retirement. For example, should a retiree withdraw funds from the taxable account then the traditional IRA and then the Roth IRA or would another sequence be preferable? (In this study, “traditional IRA” includes 401(k), 403(b), and other tax-deferred accounts.)

Most of the study’s key ideas flow from two principles. The first principle is that returns on funds held in Roth IRAs and traditional IRAs grow effectively tax exempt, while funds held in taxable accounts are usually taxed at positive effective tax rates. This gives rise to the general rule of thumb to withdraw funds from taxable accounts before retirement accounts—e.g., Roth IRAs and traditional IRAs. Models suggest that this withdrawal strategy might help a retiree’s financial portfolio last a few years longer than a strategy of withdrawing funds from retirement accounts first. The years of additional portfolio longevity increase with the retiree’s level of wealth and rate of return on assets.

There are at least two times when a retiree should deviate from this rule of thumb. First, before required distributions begin at age 70½, retirees may have minimal taxable income in which case they should withdraw sufficient funds from traditional IRAs (or convert sufficient funds from traditional to Roth IRAs) to fully use low tax rates. Second, retirees who have substantial unrealized gains on taxable assets and will await the step-up in basis at death should withdraw funds from retirement accounts before liquidating the appreciated asset.

The second principle affecting withdrawal strategies is the idea that $(1 - t_n)$ of a traditional IRA’s principal belongs to the investor with the government “owning” the other t_n , where t_n is the tax rate when the funds are withdrawn. The objective is to minimize t_n , the government’s share of the principal. The retiree should withdraw funds from a traditional IRA whenever she is in an unusually low tax bracket. As discussed earlier, this could occur before required distributions begin if the retiree has minimal taxable income. In addition, it could occur in a year when the retiree makes a large one-time contribution. Finally, a retiree will likely be in a low tax bracket in years when she has large medical expenses, perhaps due to a stay in a nursing home.

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Finally, this study considers factors that should influence the decision to withdraw funds from a traditional IRA before a Roth IRA or vice versa. Withdrawing funds from the traditional IRA makes sense 1) in years when the retiree is in a low tax bracket and 2) if the retiree's beneficiary will be in a higher tax bracket. For example, if the retiree is in the 25% tax bracket and her beneficiary is in the 33% bracket then a \$100 withdrawal from the traditional IRA would be worth \$75 after taxes to the retiree but only \$67 for the beneficiary. An additional benefit of withdrawing funds from the traditional IRA is that it would reduce future required minimum distributions. In contrast, withdrawing funds from a Roth IRA instead of a traditional IRA makes sense 1) in years when the retiree is in a high tax bracket and 2) if the retiree's beneficiary—whether an individual or a charity—will be in a lower tax bracket. For example, if the retiree is in the 25% tax bracket then a \$100 withdrawal from the traditional IRA would be worth \$75 after taxes to the retiree but \$100 if saved for the charity. In addition, Roth IRA withdrawals should be preferred if the retiree expects to have large deductible medical expenses later in retirement.

In sum, as a rule of thumb retirees should withdraw fund from taxable accounts before retirement accounts. However, there are exceptions to this rule. Retirees should try to time the withdrawal of funds from traditional IRAs for years when they are in or will be in an unusually low tax bracket. These years could occur early in retirement before required distributions begin and late in retirement years when medical expenses are high. The preferred sequence for withdrawing funds from traditional IRAs and Roth IRAs depends upon uncertain factors such as the retiree's lifespan, future health, the retiree's and individual beneficiary's future tax rates, and whether the retiree wishes to leave funds to a charity. Nevertheless, knowledge of the key factors should help retirees develop an informed withdrawal strategy.

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INTRODUCTION

SEQUENCING OF ACCOUNTS TO TAP IN RETIREMENT¹

This study discusses strategies for selecting the sequence of withdrawing funds from savings vehicles during retirement. For example, suppose a retiree has funds in taxable accounts, traditional IRAs, and Roth IRAs. Should she withdraw funds from the taxable account then the traditional IRA and then the Roth IRA or would another sequence be preferable? How, if at all, should the withdrawal sequence change if she hopes to pass funds to her children or a charity after her death? This study is designed to answer these and related questions.

WITHDRAWAL STRATEGIES: TAXABLE ACCOUNTS BEFORE RETIREMENT ACCOUNTS OR VICE VERSA?

In this section, we examine how alternative withdrawal strategies affect a portfolio's longevity, that is, the length of time before a portfolio runs out of money. It assumes all funds will be used to finance an individual's or couple's retirement needs, but it ignores questions related to beneficiaries' tax rates. Issues related to beneficiaries will be addressed later. This section begins with an intuitive discussion. It then summarizes the results of detailed models that suggest how the choice of withdrawal strategies will affect a portfolio's longevity.

The key to understanding withdrawal strategies is to look at the effective tax rates on funds held in taxable accounts, Roth IRAs, and traditional IRAs. (Unless otherwise stated, in this study "traditional IRA" is used to denote funds in all tax-deferred retirement accounts including 401(k), 403(b), 457, Keogh, SEP-IRA, and Simple plans.) In the base case, let us assume a retiree is currently in and expects to remain in the 25% ordinary income tax bracket, 15% long-term capital gain tax bracket, and has the following effective tax rates:

- 25% on interest income on taxable bonds held in taxable accounts
- 15% on stocks held in taxable accounts
- 0% on funds held in Roth IRAs, and
- 0% on funds held in traditional IRAs.

Interest income is taxable at the ordinary income tax rate. In the base case, we assume the individual pays an effective tax rate of 15% on stocks held in taxable accounts. As we shall see, the key assumption is that the individual eventually pays taxes on realized capital gains, so the

¹ I thank Mimi Lord, Doug Rothermich, and Alicia Waltenberger for their valuable comments.

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effective tax rate on stocks held in taxable accounts is well above zero. Later, we will consider individuals who will avoid paying capital gain taxes by awaiting the step-up in basis. For these relatively few individuals, their effective tax rate on stocks held in taxable accounts may be approximately zero. To repeat, the base case represents the vast majority of individuals who will eventually pay taxes on capital gains and thus pay effective tax rates on stock that are well above zero. Funds in Roth IRAs grow tax exempt as long as the Roth IRA has been in existence for at least five years and the individual withdraws funds after attaining age 59½. What may not be as obvious is that the *after-tax* value of funds in traditional IRAs also grows effectively tax exempt. The next paragraph presents an example that may clarify this point. A more detailed explanation is provided in an appendix and in Reichenstein (2006), an earlier issue of *Trends and Issues*.

Without loss of generality, let us compare the purchasing power of \$750 of *after-tax funds* in a Roth IRA to \$1,000 of *pretax funds* in a traditional IRA for someone who will withdraw the funds when he is in the 25% tax bracket. If invested in the same asset, \$750 in the Roth will buy the same amount of goods and services as \$1,000 in the traditional IRA. So, it is useful to view \$1,000 of pretax funds in a traditional IRA as if it was \$750 of after-tax funds in a Roth IRA. Generalizing, it is useful to view each pretax dollar in a traditional IRA as if it was $(1-t_n)$ dollar of the individual's after-tax funds held in a Roth IRA, where t_n is the tax rate upon withdrawal. The remaining t_n is the government's share of the current principal. Since funds in a Roth IRA grow tax exempt, it follows that the *after-tax* value of funds in the traditional IRA grows effectively tax exempt, too. For example, if the cumulative pretax return on the asset before withdrawal is 100%, the traditional IRA's purchasing power will double to \$1,500.

In general, withdrawals should come first from the account with the highest effective tax rate, followed by the account with the second highest effective rate, and so on. Therefore, in general, the retiree should withdraw funds from taxable accounts before retirement accounts, i.e., traditional and Roth IRAs. To be more specific, in general, retirees should withdraw funds from bonds and then stocks held in taxable accounts, and then withdraw funds from retirement accounts. Funds should be withdrawn from bonds before stocks in taxable accounts because of the bonds' higher ordinary income tax rate. "Bonds" in the prior sentence, refers to all assets whose returns are taxed at ordinary income tax rates, which would include cash assets like money market funds, individual bonds and bond funds, and real estate investment trusts, since REITs typically pay high non-qualifying dividends that are subject to ordinary income taxes.²

² There is one exception to the rule of thumb to withdraw funds from fixed-income assets before stocks when held in taxable accounts. If the fixed-income assets are liquidity reserves—reserves that are intended to pay for unexpected bills such as a new dryer or major car repairs—then they must be maintained in taxable accounts to serve their purpose.

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Later, the study discusses factors that should influence the order of withdrawals from traditional IRAs and Roth IRAs.

Withdrawal Models

This section discusses the results of withdrawal models that suggest how a portfolio's longevity will be affected by the choice of withdrawal sequences. In the base case, the 66-year-old retired couple has a \$2 million after-tax portfolio consisting of \$0.8 million in taxable accounts and \$1.2 million after taxes in retirement accounts. Table 1 below presents the base-case portfolio. For simplicity, the models assume the retirement accounts consist entirely of traditional IRAs, so the couple has \$1.2 million of after-tax funds (or \$1.6 million of pretax funds) in traditional IRAs, where the tax bracket is 25%. However, since \$1,600 pretax in a traditional IRA is like \$1,200 after taxes in a Roth IRA for this couple, the \$1.2 million after taxes in retirement accounts could just as well be \$0.8 million after taxes (or \$1,066,667 pre-taxes) in traditional IRA and \$0.4 million in Roth IRA or any other combination totaling \$1.2 million of after-tax funds. The underlying asset earns a 6% net return each year and inflation is 3% each year.

Table 1: Retiree's After-tax Portfolio	
Taxable Accounts	Retirement Accounts*
\$800,000 after taxes	\$1,200,000 after taxes

** Retirement accounts include traditional IRAs and Roth IRAs. The models assume the \$1,200,000 after taxes in retirement accounts is \$1,600,000 pre-taxes in traditional IRAs, where the individual is usually in the 25% tax bracket. But it could also be \$600,000 after taxes each in traditional and Roth IRAs or any other combination totaling \$1,200,000.*

To be consistent with the asset-location advice given in Dammon, Spatt, and Zhang (2004), Reichenstein (2006) and by other scholars, the base case assumes that, in general, taxable accounts contain stocks while retirement accounts contain bonds. After each withdrawal, the portfolio is rebalanced back to the target asset allocation, which is assumed to be 50% bonds and 50% stocks. When necessary to attain the target allocation, either taxable accounts or retirement accounts will contain both bonds and stocks. The couple's objective is to spend the same inflation-adjusted after-tax amount each year for 30 years. Although most people do not live to their mid-90s, a 30-year lifespan is assumed so there will be reasonable assurance that the funds will last the couple's joint life expectancy. Given these assumptions, the retired couple can live on \$102,529 after taxes in the first year, an inflation-adjusted equivalent amount each

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year thereafter, and the portfolio will be exhausted after 30 years. Spreadsheet details are available from the author upon request.³

Initially, let's compare two withdrawal strategies. The "Taxable Accounts First" strategy (henceforth, Taxable 1st) uses the following sequence of withdrawals:

1. Required minimum distributions from traditional IRAs, if any
2. Withdrawals from taxable accounts
3. Withdrawals from retirement accounts, that is, the traditional IRAs.

In contrast, the "Retirement Accounts First" strategy (henceforth, Retirement 1st) uses the following withdrawal sequence:

1. Required minimum distributions from traditional IRAs, if any
2. Withdrawals from retirement accounts
3. Withdrawals from taxable accounts.

In both strategies, the first withdrawal is the required minimum distribution (RMD) from traditional IRAs. There is a 50% penalty tax on the amount of the RMD the couple fails to withdraw, so they must satisfy the RMD. However, there are no required distributions until after the traditional IRA owner reaches age 70½. For assets held in an employer sponsored retirement plan (e.g., a 403(b) or 401(k)) of the individual's current employer, there are no required minimum distributions until after the individual has retired from that employer.

In the Taxable 1st sequence, after satisfying required distributions, withdrawals come from taxable accounts before retirement accounts because of the higher effective tax rates on funds

³ For simplicity, the base case assumes there is one asset and it earns a constant 6% net return before taxes. These assumptions make this study inappropriate for considering the question of determining the largest sustainable withdrawal rate in retirement. However, it is useful to compare the \$102,529 sustainable real withdrawal amount with the conclusions from the withdrawal rate literature. The \$102,529 represents a 5.13% withdrawal rate of their \$2 million after-tax portfolio. The withdrawal rate literature suggests that new retirees may withdraw between 4% to 4.5% of the initial portfolio value (and an inflation-adjusted equivalent amount each year thereafter) and be reasonably assured of not running out of money within 30 years. For example, see Bengen (1996) and Cooley, Hubbard, and Walz (1998). However, the withdrawal rate literature does not distinguish between pretax and after-tax funds. Therefore, it would view the initial withdrawal rate as 4.27% or \$102,529/\$2,400,000, where the latter consists of \$1.6 million of *pretax* funds in traditional IRAs and \$0.8 million of *after-tax* funds in taxable accounts. Thus the 5.13% withdrawal rate of the \$2 million after-tax portfolio is consistent with a 4% to 4.5% withdrawal rate from a traditionally-measured portfolio.

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held in taxable accounts. After funds in taxable accounts have been exhausted, the couple begins withdrawing funds from retirement accounts.

The top half of Table 2 presents estimates of the relative advantage of the Taxable 1st strategy compared to the Retirement 1st strategy. To repeat, the Taxable 1st strategy is exhausted after 30 years. The second row indicates that the couple's \$2 million portfolio would be exhausted after 27.4 years if it followed the Retirement 1st strategy; technically, it had enough funds to finance 0.4 of the 28th year's expenses. The relative advantage of the Taxable 1st strategy is 2.6 years.

Table 2: Estimates of Portfolio Longevity by Withdrawal Strategy

A. Base Case: \$2 million after-tax portfolio	
Withdrawal Strategy	Longevity (years)
Taxable 1 st	30.0
Retirement 1 st	27.4
Taxable 1 st 10%	30.06
Taxable 1 st 15%	30.07
B. Sensitivity Analysis	Additional Longevity* (years)
Base Case	2.6
Portfolio Size	
--\$1m after-tax portfolio	0.8
--\$5m after-tax portfolio	2.9
Net Rate of Return	
--7% (1% higher than base case)	3.3
Tax Rate	
--25% (10% higher than base case)	3.7
--passive stock investor (9.6% effective tax rate)	1.9

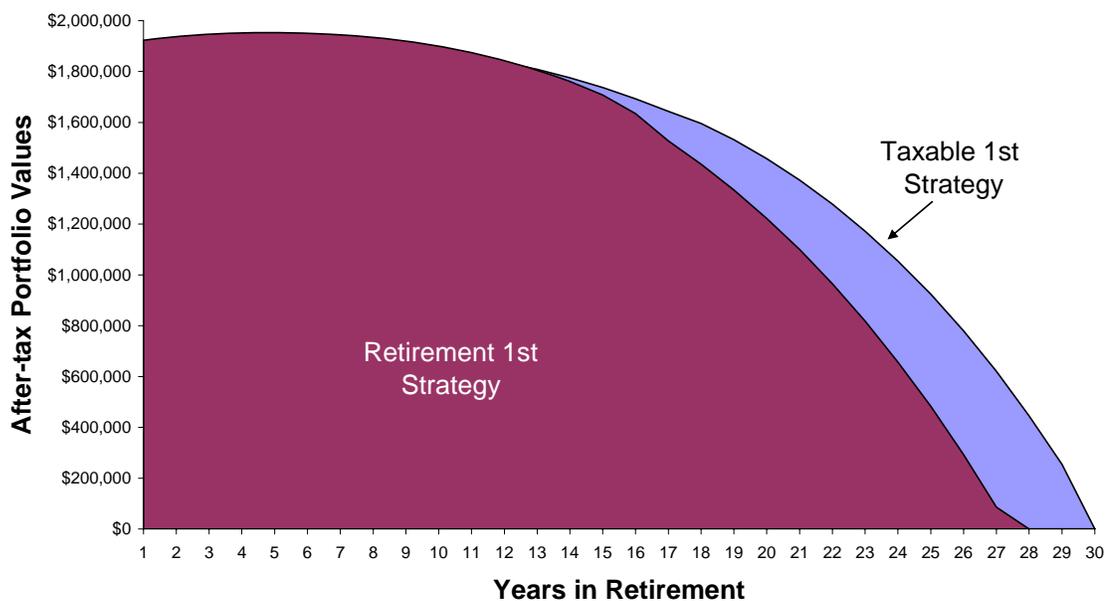
*Additional longevity denotes the additional longevity of the Taxable 1st strategy compared to the Retirement 1st strategy, when annual withdrawals deplete the portfolio using the Taxable 1st strategy at 30 years.

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Figure 1 illustrates the Taxable 1st strategy's relative advantage. With the Taxable 1st strategy, the \$2 million portfolio is just sufficient to finance a 30-year retirement, while the Retirement 1st strategy runs out of funds after 27.4 years. This 2.6-year longevity gain comes from the Taxable 1st strategy's better use of the tax code. In particular, it withdraws funds from taxable accounts, which are taxed at positive tax rates, before retirement accounts, which are effectively tax exempt.⁴

Figure 1. Withdrawal-Location Strategies



Panel A of Table 2 also presents the longevity of two other withdrawal strategies. The Taxable 1st 10% strategy differs from the Taxable 1st strategy in that the couple withdraws sufficient funds from traditional IRAs before required minimum distributions begin to fully use the 10% marginal tax bracket. In the Taxable 1st strategy, from ages 66 through 69 the retired couple

⁴ Another advantage of the Taxable 1st strategy is that it better accommodates the portfolio rebalancing. Since taxable accounts are liquidated first, most remaining assets will likely be in retirement accounts. Thus taxable accounts will likely contain only stocks, while retirement accounts will likely contain stocks and bonds. To attain the target asset allocation, the individual can exchange stocks for bonds or bonds for stocks within retirement accounts, where there are no tax consequences. In contrast, with the Retirement 1st strategy most remaining assets will likely be in taxable accounts, and exchanging stocks for bonds or bonds for stocks within taxable accounts are taxable events.

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withdraws all funds from taxable accounts. Since the cost basis of the stocks equals the market value, these withdrawals are principal only, so the couple has no taxable income resulting from the withdrawals.

In the Taxable 1st 10% strategy, the couple withdraws sufficient funds from the traditional IRA from ages 66 through 69 to fully use the 10% tax bracket.⁵ Withdrawals from taxable accounts are lowered accordingly. For example, at age 66 the retiree is assumed to withdraw \$14,000—the top of the 10% tax bracket for the 2005 tax year—from the traditional IRA and \$88,529 or \$102,529-\$14,000 from the taxable account. In the Taxable 1st 10% strategy, the portfolio lasts 30.06 years.

In the Taxable 1st 15% strategy, the couple withdraws sufficient funds from the traditional IRA from ages 66 through 69 to fully use the 15% tax bracket. It results in portfolio longevity of 30.07 years. The Taxable 1st 15% strategy slightly lengthens the portfolio's longevity.

There are two reasons why the Taxable 1st 10% and Taxable 1st 15% strategies do not substantially lengthen the portfolio's longevity. First, in the base case there are only four years of withdrawals before the couple must begin required minimum distributions. The additional longevity from the Taxable 1st 10% strategy would be 0.2 years if retirement began at age 62. Similarly, a professor who works beyond age 70½ can delay required minimum distributions from the 403(b) plan at his current university until after retirement. This would increase the longevity advantage. Second, there is a tradeoff to, say, the Taxable 1st 10% strategy: It allows funds to be withdrawn from traditional IRAs while in a low tax bracket, but this also reduces traditional IRA funds that are growing effectively tax free. Despite the tradeoff, before required distributions begin, retirees should consider withdrawing funds from traditional IRAs if they will be taxed at relatively low tax rates. If a young retiree does not need these funds to finance that year's retirement needs then she should consider a Roth IRA conversion.⁶

Sensitivity Analysis

Estimates of the additional longevity from following the Taxable 1st strategy instead of the Retirement 1st strategy are sensitive to a host of assumptions. This section is designed to provide some indication of the sensitivity of results to key assumptions.

⁵ The models assume RMDs begin in the year the couple attains age 70.

⁶ In a conversion, pretax funds in traditional IRAs are recognized as income and thus “converted” in that year to after-tax funds in a Roth IRA. For example, \$10,000 of pretax funds in a traditional IRA could be converted to \$10,000 of after-tax funds in a Roth IRA, but the retiree would have to pay taxes on the \$10,000 of income that year. If possible, the taxes should be paid from taxable accounts because of their less advantageous tax structures. Thus retirees may take advantage of low tax rates to convert funds from a traditional IRA, but these funds do not need to be spent.

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Panel B of Table 2 presents results for \$1 million and \$5 million after-tax portfolios. The \$1 million portfolio is assumed to contain \$700,000 after taxes in traditional IRAs and \$300,000 in taxable accounts, while the \$5 million portfolio contains \$2 million and \$3 million, respectively. These distributions reflect the fact that the portion of a retiree's portfolios held in taxable accounts usually increases with wealth.

The Taxable 1st strategy allows the \$1 million portfolio to last an additional 0.8 years. Recall that, in the Taxable 1st strategy, funds are withdrawn from the taxable account before the retirement accounts because of the higher tax rate on the taxable account. For a \$1 million portfolio (and today's tax structure), the retired couple is usually in the 15% ordinary income tax bracket and 5% capital gain tax rate. Therefore, the Taxable 1st strategy's comparative advantage is smaller. Nevertheless, this gain in longevity can be obtained with no personal sacrifice.

The Taxable 1st strategy allows the \$5 million portfolio to last an additional 2.9 years. The investor is usually in the 28% ordinary income tax bracket and the 15% capital gain tax bracket. So, the comparative advantage of the Taxable 1st strategy is larger.

Separately, the relative advantage of the Taxable 1st strategy is largest when the portfolio is roughly evenly divided between retirement accounts and taxable accounts.

The relative advantage of the Taxable 1st strategy increases with the asset's rate of return. For example, when the net return increases from 6% to 7%, the base case's relative advantage increases from 2.6 to 3.3 years.

The relative advantage of the Taxable 1st strategy increases with the effective tax rate on the asset held in taxable accounts. The base case assumes the taxable asset is actively-managed stocks with a 15% effective tax rate. If we return to a 20% capital gain tax rate then the Taxable 1st strategy's comparative advantage would be even larger.⁷ Similarly, if taxable accounts contain bonds with their higher tax rates then the relative advantage also would be larger. For example, if taxable accounts contained bonds taxed at 25% then the relative advantage would increase from 2.6 to 3.7 years.

As discussed in Reichenstein (2006), if taxable accounts contain passively managed stocks then their effective tax rate is lower and the relative advantage decreases. For example, if stock prices rise by 6% per year for 20 years and then these gains are realized and taxed at 15%, the

⁷ A return to a 20% capital gain tax rate would also increase the benefit of awaiting the step-up in basis, which is discussed later in this study.

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effective tax rate decreases to 9.6%.⁸ In this situation, the Taxable 1st strategy's relative advantage decreases from 2.6 to 1.9 years.⁹

In summary, so far, we have considered withdrawal strategies for the vast majority of retirees who pay effective tax rates that are well above zero on bonds and stocks held in their taxable accounts. In general, after satisfying any required minimum distributions, they should withdraw funds from taxable accounts before retirement accounts. However, before required minimum distributions begin, they should consider withdrawing sufficient funds from traditional IRAs (and other tax-deferred accounts) to fully use low tax brackets.

The next section is designed to discuss whether retirees with substantial unrealized capital gains should also follow the rule of thumb to withdraw funds from taxable accounts before retirement accounts.

Unrealized Gains and Step-Up in Basis

This section is designed to provide advice for retirees who have substantial unrealized gains on assets held in their taxable accounts. This would include individuals who passively manage individual stocks or invest in passive mutual funds such as most index funds and exchanged traded funds. As we shall see, there are circumstances where they should withdraw funds from retirement accounts before taxable accounts.

To understand why unrealized gains are important, we should review the rules for the step-up in basis at death. Suppose Marie and Jose, both U.S. citizens, are married and have Exxon-Mobil stock in their taxable account with a cost basis of \$100,000 but market value of \$320,000. Jose dies. If they live in a community property state (and the asset is their community property) then the stocks' cost basis rises to \$320,000. After his death, Marie could sell the stock and pay no taxes on the \$220,000 of capital gains. If they live in a common law state then, at Jose's death, the cost basis of each share rises by half the unrealized gain. If Marie sold all the stock immediately after his death, she would owe taxes on \$110,000 of gains. Alternatively, if the stock is held until after Marie's death then the cost basis will rise to the market value at her death, and no one will ever pay capital gain taxes on the unrealized gains.

Let's assume Marie and Jose live in a community property state and hold all property as community property. They have funds in 1) retirement accounts, 2) a taxable account containing

⁸ The original \$1 grows to $(1.06)^{20}$ or \$3.21. Upon withdrawal, taxes at 15% are paid on the \$2.21 of capital gains. The after-tax value is \$2.88, which represents a 5.42% geometric average rate of return. So the effective tax rate is $(6\% - 5.42\%) / 6\%$ or 9.6%.

⁹ This relative advantage was estimated by inserting a 9.6% effective rate in the model.

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a passive stock fund with a cost basis of \$100,000 and market value of \$250,000 and 3) taxable accounts containing other stocks and stock funds with cost bases and market values of about \$200,000 each. They should withdraw funds from the \$200,000 of stocks with negligible unrealized gains before withdrawing funds from either retirement accounts or the appreciated stock fund with substantial unrealized gains.

After withdrawing funds from the \$200,000 pot, let's consider their decision to withdraw funds from the appreciated stock fund held in taxable account or a retirement account. If the appreciated stock fund will eventually be liquidated and capital gains taxes paid then Marie and Jose should withdraw funds from this appreciated stock fund before the retirement account. This would be similar to the earlier example where passive management lowered the effective tax rate on stocks from 15% to 9.6%; after all, the 9.6% rate is still higher than the 0% effective rate on the retirement account.

On the other hand, if they will await the step-up in basis then they should withdraw funds from the retirement account first and postpone withdrawals from the appreciated stock fund until after the death of the first spouse. For example, suppose Jose is terminally ill and has a short life expectancy. It would not make sense to sell the appreciated stock before his death. Instead, they should withdraw funds from the retirement accounts until after his death.

The more difficult question concerns a, say, 70-year-old healthy couple. Should they withdraw funds from retirement accounts and postpone the withdrawal from the appreciated stock fund until after the inevitable death of the first spouse? Unfortunately, the better strategy is not always obvious. If they live long enough, they may need to realize the capital gain in the taxable account. If one spouse dies soon then, after the fact, the better strategy would have been to hold onto the appreciated stock. My suggestion is that they should withdraw funds from the appreciated stock if they expect to eventually realize these gains before the death of the first spouse. If they are confident that they can refrain from realizing these gains until after the first death then they should withdraw funds from their retirement accounts and await the step-up in basis. Since individuals' longevities are uncertain, the best strategy is not always obvious.

The key is to realize that retirees can avoid paying taxes on appreciated stocks (or any other appreciated asset) by awaiting the step-up in basis. In essence, the effective tax rate on the capital gains may be zero, but only if they await the step-up at death. If there are other assets that can be liquidated, including funds in retirement accounts, then these funds can be used to finance retirement needs until after the death.¹⁰

¹⁰ There is another excellent use of stocks with substantial unrealized gains. These appreciated assets could be given to a qualified charity. The donor could deduct the market value, while the charity could sell the appreciated asset and avoid taxes due to its tax-

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WITHDRAWAL STRATEGIES: TRADITIONAL IRAs BEFORE ROTH IRAs OR VICE VERSA?

The prior section examined the impact on portfolio longevity of the decision to withdraw funds from taxable accounts before retirement accounts or vice versa. It ignored the question about whether retirees should withdraw funds from traditional IRAs before Roth IRAs or vice versa. Also, it ignored questions about beneficiaries' tax rates. This section addresses these issues.

A key to this section is the idea that $(1 - t_n)$ of a traditional IRA's principal belongs to the investor with the government owning the other t_n , where t_n is the tax rate when the funds are withdrawn. The objective is to minimize t_n , the government's share. Most strategies in this section are based on withdrawing funds in ways to minimize t_n . For example, in the prior section we encouraged young retirees who have yet to begin required distributions to withdraw sufficient funds from traditional IRAs (and correspondingly reduce withdrawals from taxable accounts) to fully use lower tax brackets. Other strategies in this section are designed to minimize taxes on withdrawals from traditional IRA.

There are at least three reasons why retirees might withdraw funds from traditional IRAs before Roth IRAs. First, withdrawing funds from the traditional IRA will reduce future required minimum distributions and thus provide more flexibility when withdrawing funds in later years. Second, if the retiree is in a low tax bracket one year—perhaps due to a large one-time contribution—then the retiree should use this opportunity to withdraw (or convert) funds from traditional IRAs. Third, if the retiree's beneficiary will be in a higher tax bracket then, everything else the same, the retiree should withdraw funds from the traditional IRA and leave the Roth IRA for the beneficiary. For example, if the retiree is in the 15% tax bracket and the beneficiary is in the 28% bracket, then \$100 of pretax funds in a traditional IRA would be worth \$85 after taxes to the retiree or \$72 to the beneficiary.¹¹

There are at least two reasons why retirees might withdraw funds from Roth IRAs before traditional IRAs. First, if the beneficiary—whether an individual or a charity—will be in a lower tax bracket then, everything else the same, the retiree should withdraw funds from the Roth IRA first and leave the traditional IRA for the beneficiary. For examples, if the retiree is in the 25% tax bracket and the individual beneficiary is in the 10% bracket, then \$100 of pretax funds in a

exempt status. For example, if the donor contributed stocks worth \$30,000 with a cost basis of \$10,000 then he could deduct the \$30,000 (subject to possible limitations relating to the donor's adjusted gross income in the year of the gift) and the charity would avoid taxes on the sale of the asset.

¹¹ This example assumes the beneficiary withdraws all funds in the first year after the retiree's death and all funds are taxed at the same marginal tax rate. Although withdrawals do not need to occur in the first year, the example conveys the key idea. Slott (2003) discusses the benefits of forming a stretch IRA, where the tax-deferral period is stretched to its legal maximum. By withdrawing funds as slow as possible from IRAs, beneficiaries attain the maximum benefit of their tax-advantaged status.

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traditional IRA would be worth \$75 after taxes to the retiree or \$90 to the individual beneficiary. If the beneficiary is a charity then it pays to save sufficient funds in traditional IRAs to fully fund the charitable gift. The \$100 of pretax funds in a traditional IRA would be worth \$75 after taxes to the retiree or \$100 to the charitable beneficiary.¹² Second, retirees anticipating large medical expenses later in retirement should withdraw funds from Roth IRAs before traditional IRAs in the early retirement years.

Medical expenses deserve additional discussion. Medical expenses are deductible from taxable income to the degree they exceed 7.5% of adjusted gross income. A portion of the fees paid by a resident to a nursing facility or retirement community that provides medical services can be deducted as a medical expense. The deductible portion often varies by facility and level of care. This deductible portion is based on the portion of expenses directly associated with medical expenses. It is often 100% for full nursing home care, but lower for assisted living and independent living.¹³ Therefore, retirees anticipating the need for a nursing home may defer traditional IRA withdrawals until later in life since the large medical expense deduction would likely make these withdrawals tax free. Due to the high cost of retirement homes, even if only one spouse needs assistance the couple's taxable income might be nil.

Finally, there are situations where it would be in the retiree's best interest to withdraw funds simultaneously from both Roth and traditional IRAs. Suppose a retiree will live a long time, spend all his retirement funds on himself, and will not need a retirement home. Horan (2006) shows that his best strategy would be to withdraw sufficient funds from traditional IRAs each year to fully use lower tax brackets and to withdraw remaining funds from Roth IRAs. The best strategy would be the one that allows him to minimize the average tax rate on withdrawals from traditional IRAs.

Obviously, the "best" strategy for withdrawing funds from Roth IRAs and traditional IRAs depends upon uncertain factors such as the retiree's lifespan, future health, the retiree's and individual beneficiary's future tax rates, and whether the retiree wishes to leave funds to a charity. Nevertheless, knowledge of the key factors should help retirees develop an informed withdrawal strategy.

¹² Suppose someone wants to leave half her estate to children and half to charity, and she has \$100,000 in taxable accounts and \$100,000 of pretax funds in traditional IRAs. She should leave the taxable accounts to the children and the traditional IRA to the charity. The assets in the taxable account would be worth \$100,000 after taxes to charity or children (after receiving the step up in basis). In contrast, the \$100,000 of pretax funds in the traditional IRA would be tax free to the charity but taxable to the children.

¹³ Some expenses in independent living facilities may be deductible. When the primary reason for the stay is for personal reasons, then only the costs of actual medical care are a deductible medical expense.

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DISCUSSION AND SUMMARY

Most of the key ideas in this study flow from two principles. The first principle is that returns on funds held in Roth IRAs and traditional IRAs grow effectively tax exempt, where traditional IRAs in this context includes 401(k), 403(b), and other tax-deferred accounts. Therefore, the rule of thumb is to withdraw funds from taxable accounts before withdrawing funds from Roth IRAs and traditional IRAs. The government requires minimum distributions from traditional IRAs after age 70½, which places some limitations on this rule of thumb. Nevertheless, detailed models, which consider required distributions, suggest that following this rule of thumb might help a retiree's financial portfolio last a few years longer.

In addition, this study noted times when retirees should deviate from this rule of thumb. For example, before required distributions begin at 70½, retirees may have minimal taxable income. In these cases, they should consider withdrawing sufficient funds from traditional IRAs (or converting sufficient funds from traditional to Roth IRAs) to fully use low tax rates. In addition, retirees who have substantial unrealized gains on taxable assets and will await the step-up in basis at death should withdraw funds from Roth IRAs and traditional IRAs before liquidating the appreciated asset.

The second principle affecting withdrawal strategies is the idea that $(1 - t_n)$ of a traditional IRA's principal belongs to the investor with the government owning the other t_n , where t_n is the tax rate when the funds are withdrawn. The objective is to minimize t_n . As just noted, before required distributions begin, retirees may have minimal taxable income and should consider withdrawing sufficient funds from traditional IRAs to fully use low tax rates. Separately, retirees may be subject to a low tax bracket in some years—perhaps a year when they make a large charitable contribution or years when they have large medical expenses such as nursing home expenses. Also, if a retiree or retired couple wishes to leave funds after their deaths to a charity then they should leave sufficient funds in traditional IRAs to fully fund this gift.

This study also addresses the issue of whether a retiree should withdraw funds from traditional IRAs before Roth IRAs or vice versa. One factor in this decision is the relationship between the retiree and beneficiary's tax brackets. Everything else the same, if the retiree is in a higher tax bracket than the beneficiary then she should withdraw funds from the Roth IRA and save the traditional IRA for the beneficiary. In general, if the retiree is in a lower tax bracket then she should withdraw funds from the traditional IRA and save the Roth IRA for the beneficiary.

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APPENDIX: BACKGROUND INFORMATION

As background, it is important to review principles established in Reichenstein (2006), “Tax Efficient Saving and Investing,” a previous publication in *Trends and Issues*, <http://www.tiaa-crefinstitute.org/research/trends/tr020106b.html>. These principles are related to 1) effective tax rates on stocks and bonds held in each savings vehicle and 2) the calculation of an after-tax asset allocation. This section develops models that provide this background. For further details, see that publication.

Table A1 presents after-tax ending wealth models per \$1 currently in a Roth IRA, traditional IRA, and taxable account. (In this appendix, “traditional IRA” is used to denote funds in all tax-deferred retirement accounts including 401(k), 403(b), 457, Keogh, SEP-IRA, and Simple plans.) For a taxable account, we assume that the assets’ cost bases equal their market values. The pretax rate of return is $r\%$. The ordinary income tax rate is t for all years before withdrawal and t_n in the withdrawal year n years hence. The long-term capital gain tax rate is t_c , where t_c is lower than the ordinary income tax rates, i.e., $t_c < t$ and $t_c < t_n$.

Table A1. After-tax Ending Wealth Models for Bonds and Stocks in Roth IRA, TDA, and Taxable Account

	Bonds	Stocks
Roth IRA	$(1+r)^n$	$(1+r)^n$
Traditional IRA	$(1+r)^n (1-t_n)$	$(1+r)^n (1-t_n)$
Taxable Account	$(1+r(1-t))^n$	Active Investor: $(1+r(1-t_c))^n$

In a Roth IRA, the individual invests \$1 of after-tax funds, meaning the investment amount is not tax deductible in the contribution year. The returns are tax exempt as long as the Roth IRA has been in existence for at least five years and the individual withdraws funds after attaining age 59½. The account begins with \$1 of after-tax funds and is worth $(1+r)^n$ after taxes n years hence. So, the effective tax rate is zero for bonds and stocks held in a Roth IRA.

The traditional IRA contains \$1 of *pretax* funds, and it grows tax-deferred at r per year until withdrawal. Assuming withdrawal occurs after age 59½, it is worth $(1+r)^n$ pretax and $(1+r)^n (1-t_n)$ after taxes n years hence. Since the funds will be taxed at t_n upon withdrawal, it is useful to think of the investor as effectively owning $(1-t_n)$ of the current pretax principal and the government as effectively owning the other t_n . The principal effectively owned by the investor

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grows from $(1 - t_n)$ today to $(1+r)^n(1 - t_n)$ in n years. The effective tax rate is zero on bonds and stocks held in tax-deferred accounts.

An example may clarify this idea. Suppose someone has \$1,000 in a traditional IRA and the funds will be taxed at the 25% rate upon withdrawal. It is best to think of the investor as owning \$750 of the principal and the government as “owning” the other \$250. If the underlying asset earns a cumulative pretax return of 100% before withdrawal then the ending pretax balance will be \$2,000. After paying taxes at withdrawal, the investor’s share will be \$1,500 after taxes. The investor’s share doubles from \$750 today to \$1,500 at retirement. So, the effective tax rate is zero.

There are separate models for bonds and stocks held in taxable accounts. For bonds, the individual begins with \$1 of after-tax funds. The ending wealth model is $(1+r(1-t))^n$. The \$1 of after-tax funds earns r percent pretax annually and grows at the $r(1-t)$ percent after-tax rate of return. The effective tax rate is t .

As discussed in Reichenstein (2006), there is a separate ending wealth model for each stock management style. Most investors are relatively active in that they typically realize capital gains within a few years. They invest in active stock funds or actively manage their own stock portfolio. Since the average stock fund has an 87% turnover ratio, the average holding period is a little over one year.¹⁴ Therefore, we initially model an active investor who is assumed to realize all gains in one year and one day.¹⁵ Each year all stock returns—qualified dividends and capital gains—are taxed at t_c , the long-term gain tax rate.¹⁶ The ending wealth model is $(1+r(1-t_c))^n$. The \$1 of after-tax funds earns r percent pretax annually and grows at the $r(1-t_c)$ percent after-tax rate of return. The effective tax rate is t_c .

Although few investors follow this model’s precise assumptions, the key assumption is that the effective tax rate for most investors on stocks held in taxable accounts is well above zero. Therefore, as a rule of thumb, they should withdraw funds from the taxable account before the retirement account. As discussed in the text, the exception to this rule of thumb is the few individuals who will await the step-up in basis at death. In practice, I suspect the effective federal tax rate on stocks for most individuals is about 15%. They realize some short-term capital gains that are taxed at rates above 15% and allow some gains to grow unrealized that,

¹⁴ Source: Morningstar Principia, January 2006 for sample of distinct portfolios with Morningstar Category of large-cap growth, mid-cap growth, small-cap-growth, large-cap blend, mid-cap blend, small-cap blend, large-cap value, mid-cap value, or small-cap value.

¹⁵ Assuming all gains are realized each year, greatly simplifies the model with little loss of relevance. In practice, many active investors allow capital gains to grow unrealized for a few years. But there is little tax benefit to allowing gains to grow unrealized for only a few years.

¹⁶ Recent legislation extended the taxation of qualified dividends at the long-term gain tax rate through 2010.

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when realized, will be effectively taxed at rates below 15%. For many individuals, these effects are roughly offsetting so their effective rate is about 15%, the same as in the model.

Table A2 indicates the percent of principal effectively owned by and the effective tax rate for individual investors in each savings vehicle. For bonds and stocks held in a Roth IRA, the investor effectively owns 100% of principal and the effective tax rate is zero. For bonds and stocks held in a traditional IRA, the investor effectively owns $(1 - t_n)$ of principal and the effective tax rate is zero. For bonds held in taxable accounts, the investor owns 100% of principal and the effective tax rate is t . For actively-managed stocks held in taxable accounts, the investor owns 100% of principal and the effective tax rate is t_c .

Table A2. Principal Effectively Owned by and Effective Tax Rates for Investors in Roth IRA, Traditional IRA, and Taxable Account

	Principal	Effective Tax Rate
Roth IRA, bonds & stocks	100%	0%
Traditional IRA, bonds & stocks	$(1 - t_n)$	0%
Taxable Account		
Bonds	100%	t
Stocks, active investor	100%	t_c

The second principle from Reichenstein (2006) concerns the calculation of an individual's or couple's asset allocation. It encourages individuals to calculate their after-tax asset allocation, where we first convert all account values to after-tax values and then use these after-tax values to calculate the asset allocation. The pretax balances in the traditional IRA should be multiplied by $(1 - t_n)$ to convert the pretax funds to after-tax funds.

Without loss of generality, suppose someone has \$1,000 in a traditional IRA and \$750 in a Roth IRA and they are each invested in the same underlying asset. Further assume that the funds will be withdrawn in retirement when the individual will be in the 25% tax bracket. In this case, we can think of these two accounts as being essentially the same. The individual effectively owns \$750 or $(1 - .25)$ of the traditional IRA's *principal*. He has \$750 of *after-tax* funds in the traditional IRA and \$750 of after-tax funds in the Roth IRA. The after-tax asset allocation says the traditional IRA and Roth IRA are the same size and each contains \$750 of after-tax funds.

Finally, although I believe it makes sense to calculate an after-tax asset allocation, the conclusions about withdrawal strategies in retirement are not dependent on such a calculation. Thus even if you choose to calculate your asset allocation using the traditional approach, the conclusions about withdrawal strategies will remain the same.

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