



Optimal Withdrawal Strategies for Retirees with Multiple Savings Accounts

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Models for two broad tax environments

- ▶ Uniform marginal tax rate
- ▶ Progressive tax rate structure

Simulations

Taxable Accounts

Conclusions

What is the optimal withdrawal strategy for multiple retirement accounts?

Does having multiple types of retirement accounts at retirement have value?

Initial balances in a traditional IRA and a Roth IRA

Withdrawal grows annually to maintain purchasing power

Three Tax Rate Regimes

- ▶ Constant High Tax Rate - 33%
- ▶ Constant Low Tax Rate - 28%
- ▶ Alternating tax rates

Three Withdrawal Strategies

- ▶ Two Naïve Withdrawal Strategies
 - Distribute from traditional IRA first until depleted
 - Distribute from Roth IRA first until depleted

- ▶ One Informed Withdrawal Strategy
 - Traditional IRA when tax rate low; Roth when tax rate high

Required Minimum Distributions (RMDs)

Withdrawal Algorithm for First Naïve Strategy

– Withdraw from Traditional IRA until depleted

$$D_{1,Trad,t} = \min \left[\frac{W_t}{1 - T_t}, V_{Trad,t} \right]$$

$$D_{1,Roth,t} = \max \left[0, \min \left\{ W_t - D_{Trad,t} (1 - T_t), V_{Roth,t} \right\} \right]$$

Withdrawal Algorithm for Informed Strategy

$$D_{3,Roth,t} = \min[W_t, V_{Roth,t}] \quad \text{if } T_t = T_{hi}$$

$$\max\left[0, \min\left\{W_t - D_{Trad,t}(1 - T_t), V_{Roth,t}\right\}\right] \quad \text{if } T_t = T_{lo}$$

$$D_{3,Trad,t} = \max\left[0, \min\left(\frac{W_t - D_{Roth,t}}{1 - T_t}, V_{Trad,t}\right)\right] \quad \text{if } T_t = T_{hi}$$

$$\min\left[\frac{W_t}{1 - T_t}, V_{Trad,t}\right] \quad \text{if } T_t = T_{lo}$$

\$1,000,000 in traditional IRA

\$720,000 in Roth IRA

Spending rate

- ▶ 6%
- ▶ \$103,200
- ▶ Grows by 3% annually

25-year time horizon

8% return

Terminal tax rate is 28%

Table 1: After-Tax Accumulations and Withdrawal Sustainability for Three Withdrawal Strategies in Four Marginal Tax Rate Environments

Withdrawal strategy is irrelevant under constant tax rates

Withdrawal Strategy (w)	Constant 33% Tax Rate			Constant 28% Tax Rate		
	Traditional then Roth	Roth then Traditional	Informed	Traditional then Roth	Roth then Traditional	Informed
4.0%	\$3,199,075	\$3,199,075	\$3,199,075	\$3,319,341	\$3,319,341	\$3,319,341
4.5%	\$2,320,237	\$2,320,237	\$2,320,237	\$2,501,533	\$2,501,533	\$2,501,533
5.0%	\$1,441,398	\$1,441,398	\$1,441,398	\$1,683,725	\$1,683,725	\$1,683,725
5.5%	\$562,560	\$562,560	\$562,560	\$865,917	\$865,917	\$865,917
6.0%	[23]	[23]	[23]	\$48,109	\$48,109	\$48,109
6.5%	[20]	[20]	[20]	[21]	[21]	[21]
7.0%	[18]	[18]	[18]	[19]	[19]	[19]

Table 1: After-Tax Accumulations and Withdrawal Sustainability for Three Withdrawal Strategies in Four Marginal Tax Rate Environments

An Informed Strategy performs better than a naïve strategy when tax rates change

Withdrawal Strategy (w)	Alternating Tax Rate: 28%/33%			Alternating Tax Rate: 33%/28%		
	Traditional then Roth	Roth then Traditional	Informed	Traditional then Roth	Roth then Traditional	Informed
4.0%	\$3,152,837	\$3,262,724	\$3,319,341	\$3,131,858	\$3,255,692	\$3,319,341
4.5%	\$2,333,994	\$2,410,704	\$2,501,533	\$2,315,013	\$2,411,066	\$2,501,533
5.0%	\$1,521,732	\$1,564,959	\$1,683,725	\$1,492,045	\$1,560,164	\$1,683,725
5.5%	\$697,361	\$723,402	\$865,917	\$679,074	\$705,075	\$865,917
6.0%	[24]	[24]	\$48,109	[24]	[24]	\$33,585
6.5%	[21]	[21]	[21]	[21]	[21]	[21]
7.0%	[18]	[18]	[19]	[18]	[18]	[19]

Table 1: After-Tax Accumulations and Withdrawal Sustainability for Three Withdrawal Strategies in Four Marginal Tax Rate Environments

The value of an informed strategy increases with returns

Return (r)	Alternating Tax Rate: 28%/33%			Alternating Tax Rate: 33%/28%		
	Traditional then Roth	Roth then Traditional	Informed	Traditional then Roth	Roth then Traditional	Informed
5%	[16]	[16]	[17]	[16]	[16]	[16]
6%	[18]	[18]	[18]	[18]	[18]	[18]
7%	[20]	[20]	[21]	[20]	[20]	[21]
8%	[24]	[24]	\$48,109	[24]	[24]	\$33,585
9%	\$984,620	\$1,004,562	\$1,186,835	\$940,811	\$994,348	\$1,186,835
10%	\$2,449,656	\$2,535,643	\$2,715,351	\$2,418,711	\$2,515,534	\$2,715,351
11%	\$4,407,249	\$4,545,405	\$4,738,793	\$4,368,039	\$4,555,856	\$4,738,793
12%	\$6,984,666	\$7,216,917	\$7,387,551	\$6,907,064	\$7,196,057	\$7,387,551

Table 2: Differences in After-Tax Accumulations and Withdrawal Sustainability Between Informed and Naive Withdrawal Strategies in an Alternating Tax Rate Environment

The value of an informed strategy generally increases with the withdrawal rate and its growth

After-Tax Withdrawal Rate (w)								
g	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	6.5%
0.0%	[0]	[0]	\$2,238	\$24,753	\$48,275	\$69,563	\$96,832	\$120,329
1.0%	[0]	[0]	\$17,781	\$42,501	\$72,183	\$96,167	\$113,394	\$151,789
2.0%	[0]	\$7,651	\$38,138	\$62,631	\$88,948	\$121,715	\$147,517	\$157,832
3.0%	[0]	\$29,023	\$56,617	\$90,829	\$118,765	\$142,515	\$48,133	[0]
4.0%	\$14,164	\$50,020	\$79,924	\$112,339	\$151,692	[0]	[0]	[1]
5.0%	\$36,956	\$69,136	\$109,634	\$143,214	[0]	[0]	[1]	[1]
6.0%	\$58,244	\$100,000	\$139,820	[0]	[0]	[0]	[0]	[0]
7.0%	\$81,109	\$127,122	\$85,055	[1]	[0]	[0]	[1]	[0]

Note: Figures in brackets represent the difference in number of years over which withdrawals are fully sustained.

Assume tax rate structure for 2006

Brackets grow annually by inflation

Withdrawal strategies

- ▶ Distribute from traditional IRA first until depleted
- ▶ Distribute from Roth IRA first until depleted
- ▶ Informed strategies
 - Distribute from traditional IRA up to exemptions and deductions, or a specified tax bracket
 - Remainder of withdrawal comes from Roth IRA

Withdrawal Algorithm for Naïve Strategy

– Withdraw from Traditional IRA until depleted

$$D_{4,Trad,t} = \min[P(W_t), V_{Trad,t}]$$

$$D_{4,Roth,t} = \max\left[0, \min\left\{W_t - F(D_{Trad,t}), V_{Roth,t}\right\}\right]$$

where

$$P(X) = \min[X, A_{0,t}] + \sum_{j=1}^6 \frac{\max[0, \min(X, A_{j,t}) - A_{j-1,t}]}{1 - T_{bj}}$$

Pretax
Withdrawal
Function

$$F(Y) = \min[Y, B_{0,t}] + \sum_{j=1}^6 \max[0, \min(Y, B_{j,t}) - B_{j-1,t}](1 - T_{bj})$$

After-Tax
Withdrawal
Function

Withdrawal Algorithm for Informed Strategy

- Withdraw from Traditional IRA up to bracket j
- Remainder from Roth IRA

$$D_{j,Trad,t} = \max \left[\begin{array}{l} \min \{ B_{j,t}, V_{Trad,t}, P(W_t) \}, \\ \min \{ P(W_t - V_{Roth,t}), V_{Trad,t} \} \end{array} \right]$$

$$D_{j,Roth,t} = \min [W_t - D_{Trad,t}, V_{Roth,t}]$$

Table 3: Exemptions, Deductions, Tax Rates, and Tax Brackets for a Married Couple Filing Jointly in 2006

	Exemptions, Deductions, and Tax Brackets	AGI from	AGI to	Taxed at Rate
Personal Exemption and Standard Deduction	\$16,900 a	\$0	\$16,900	0%
Bracket 1	\$15,100	\$16,900	\$32,000	10%
Bracket 2	\$61,300	\$32,000	\$78,200	15%
Bracket 3	\$123,700	\$78,200	\$140,600	25%
Bracket 4	\$188,450	\$140,600	\$205,350	28%
Bracket 5	\$336,550	\$205,350	\$353,450	33%
Bracket 6	> \$336,550	\$353,450	greater	35%

a. Taxpayers over the age of 65 are entitled to an additional standard deduction of \$1,000 per spouse.

Table 4: Residual Accumulations and Withdrawal Sustainability for Various Withdrawal Strategies and Withdrawal Rates Under a Progressive Tax Rate System

Traditional then Roth is better of the two naïve strategies
Informed strategies offer substantial improvement

Panel A: Residual Accumulations and Withdrawal Sustainability						
Withdrawal Rate (<i>w</i>)	4.0%	4.5%	5.0%	5.5%	6.0%	6.5%
Traditional then Roth	\$4,789,549	\$3,796,555	\$2,825,820	\$1,874,359	\$920,329	[24]
Roth then Traditional	\$3,876,792	\$3,120,582	\$2,351,591	\$1,561,373	\$765,010	[24]
Traditional to Exemption	\$4,033,009	\$3,275,109	\$2,501,365	\$1,705,852	\$913,474	\$91,122
Traditional to Bracket 1	\$4,283,768	\$3,407,038	\$2,588,092	\$1,792,728	\$992,043	\$174,932
Traditional to Bracket 2	\$4,826,322	\$3,948,868	\$3,072,138	\$2,195,409	\$1,318,680	\$441,950
Traditional to Bracket 3	\$4,789,549	\$3,796,555	\$2,825,820	\$1,874,359	\$920,329	[24]

Table 4: Residual Accumulations and Withdrawal Sustainability for Various Withdrawal Strategies and Withdrawal Rates Under a Progressive Tax Rate System

Traditional then Roth is better of the two naïve strategies
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Panel B: Incremental Residual Accumulations and Withdrawal Sustainability over Traditional IRA Naive Withdrawal Strategy

Withdrawal Rate (w)	4.0%	4.5%	5.0%	5.5%	6.0%	6.5%
Roth then Traditional	(\$912,757)	(\$675,973)	(\$474,230)	(\$312,986)	(\$155,318)	[0]
Traditional to Exemption	(\$756,540)	(\$521,446)	(\$324,456)	(\$168,507)	(\$6,855)	n.m.
Traditional to Bracket 1	(\$505,781)	(\$389,517)	(\$237,728)	(\$81,631)	\$71,714	n.m.
Traditional to Bracket 2	\$36,773	\$152,313	\$246,318	\$321,050	\$398,351	n.m.
Traditional to Bracket 3	[0]	[0]	[0]	[0]	[0]	[0]

Table 5: Incremental Accumulations and Withdrawal Sustainability Between the Best-Informed and Naive Withdrawal Strategies for Various Withdrawal Rates and Pretax Returns

Panel A: Best Informed Strategy Compared with Best Naive Strategy							
Pretax Returns (r)	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
Withdrawal Rate (w)							
4.0%	\$6,613	\$38,917	\$18,390	\$23,740	\$36,773	[\$10,198]	[\$11,087]
5.0%	[0]	[1]	\$148,161	\$188,529	\$246,318	\$227,841	\$127,739
6.0%	[1]	[1]	[1]	n.m.	\$398,351	\$402,913	\$349,551
7.0%	[0]	[1]	[1]	[2]	[2]	\$531,275	\$531,893
8.0%	[0]	[0]	[0]	[1]	[1]	[1]	n.m.
9.0%	[1]	[0]	[0]	[0]	[1]	[1]	[1]
10.0%	[0]	[0]	[1]	[0]	[0]	[0]	[1]

Table 5: Incremental Accumulations and Withdrawal Sustainability Between the Best-Informed and Naive Withdrawal Strategies for Various Withdrawal Rates and Pretax Returns

Panel B: Best Informed Strategy Compared to Worst Naïve Strategy

<i>Pretax Return (r)</i>	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
<i>Withdrawal Rate (w)</i>							
4.0%	93,942	226,122	406,270	639,087	949,530	1,255,865	1,590,089
5.0%	[1]	[1]	256,480	450,516	720,548	978,152	1,247,515
6.0%	[1]	[1]	[2]	n.m.	553,669	759,391	988,643
7.0%	[0]	[1]	[1]	[2]	[2]	614,149	799,485
8.0%	[0]	[0]	[0]	[1]	[1]	[1]	n.m.
9.0%	[1]	[0]	[0]	[0]	[1]	[1]	[1]
10.0%	[0]	[0]	[1]	[0]	[0]	[0]	[1]

Note: Figures in brackets represent the incremental number of years over which withdrawals are fully sustained.

\$2 million in Traditional IRA and \$1.44 million in Roth

- ▶ Optimal strategy → Withdrawal up to 25% tax bracket
- ▶ Corresponds to \$140,600 AGI

\$4 million in Traditional IRA and \$2.88 million in Roth

- ▶ Optimal strategy → Withdrawal up to 28% tax bracket
- ▶ Corresponds to \$205,350 AGI

Generally, withdrawal from taxable accounts first

- ▶ Taxable withdrawals before Roth IRA
 - Preserves greater after-tax returns in Roth IRA
- ▶ Taxable withdrawals before traditional IRA
 - As long as effective tax rate on taxable account returns is less than distribution tax rate

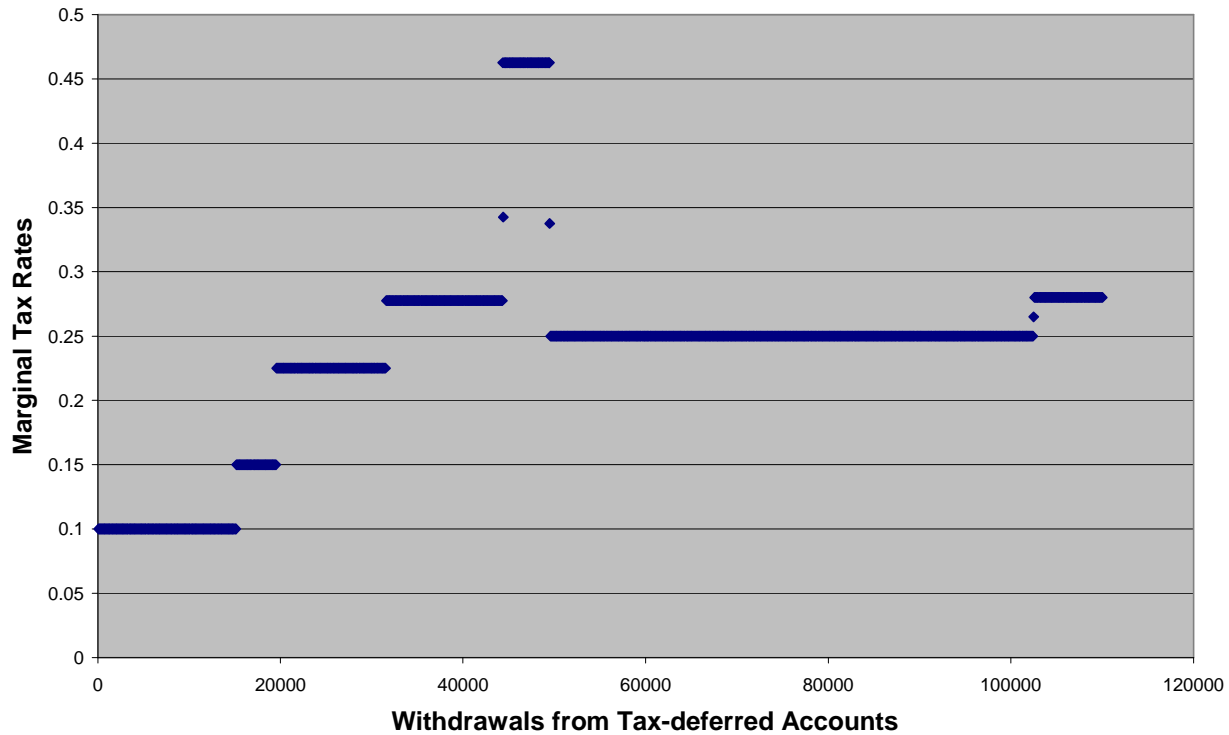
Exceptions

- ▶ Low basis stock positions
- ▶ Year in which retiree has exceptionally low tax rate (e.g., medical expenses)
- ▶ Higher tax bracket in subsequent years (?)

Value of Tax Bracket Framework

- ▶ Can be used to incorporate other factors
- ▶ Uniqueness of an individual's effective tax bands
- ▶ AMT phase-ins and phase-outs
- ▶ Social Security Tax Torpedo

Figure C1. Marginal Tax Rates on Couple's Withdrawals from Tax-deferred Accounts



Source: William Reichenstein (2007)

Cost Basis

Estate Tax

Tax Rate of Beneficiaries

The value of flexibility in the face of uncertainty

- ▶ Option value
- ▶ Monte Carlo analysis



Optimal Withdrawal Strategies from Multiple Tax-Advantaged Accounts

Questions?

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