CS 134
Operating Systems

May 1, 2019

And now for something completely different
…
Optimize your Financial Life

Based on an internal talk I gave at Google

Outline

FI

Tools

Resources

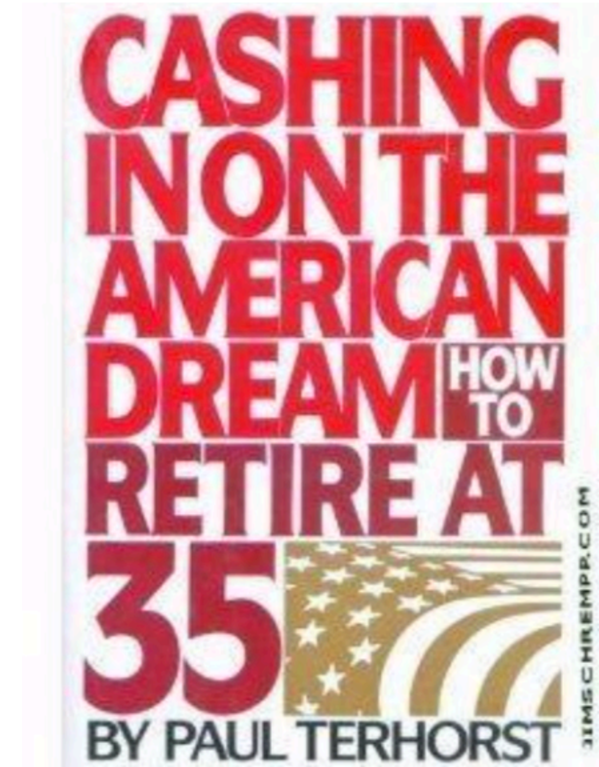
Financial Independence (FI)

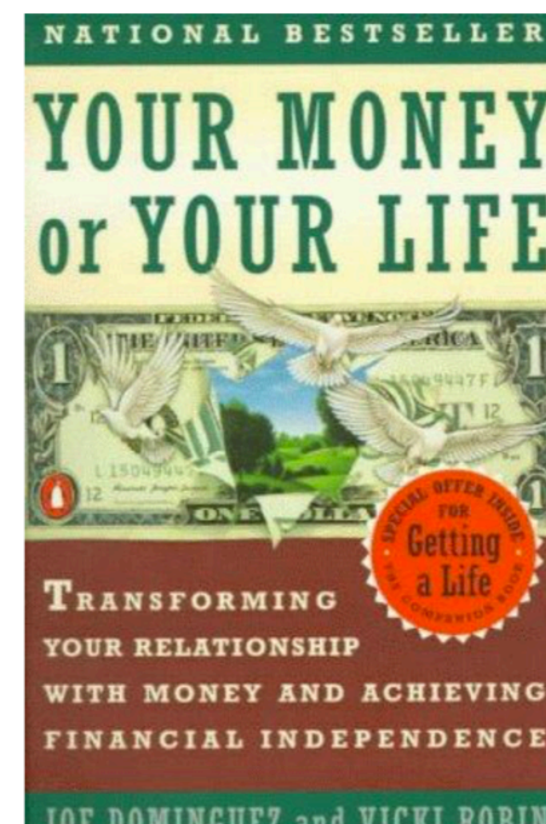
Passive income ≥ expenses

Forms of passive income:

- Rents
- Royalties
- Dividends
- Capital Appreciation

FI aka *FU money**





*…*screw-you* money. Enough to say *screw you* to anybody or anything.”—James Clavell, *Noble House*

Why Financial Independence?

Options/Freedom!

- Work because you want to, not because you have to
- Work part time
- Take extended time off
- Spend time with your kids while they’re young
- Work for a startup/non-profit/Peace Corps

Financial Independence (FI)

For a mostly-stock portfolio, how much can you withdraw per year for 30 years? Use Safe Withdrawal Rate (SFR)

What is Safe Withdrawal Rate? about 4%/year (adjusted for inflation annually). (See Trinity study)

So, $1M yields $40K/year in income (increases by inflation each year)

Alternative formulation:

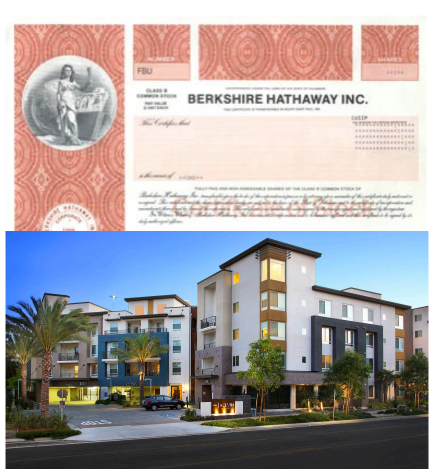
needed assets = 25 x desired annual income

Shockingly Simple Math

FI is *independent* of income!

Total income { Expenses / Savings

What is it dependent on? *Savings rate*



Assets

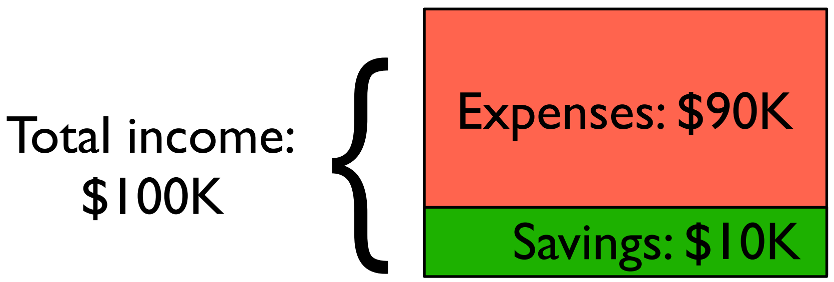
X Safe withdrawal rate =

Investment income

<? >?

Expenses

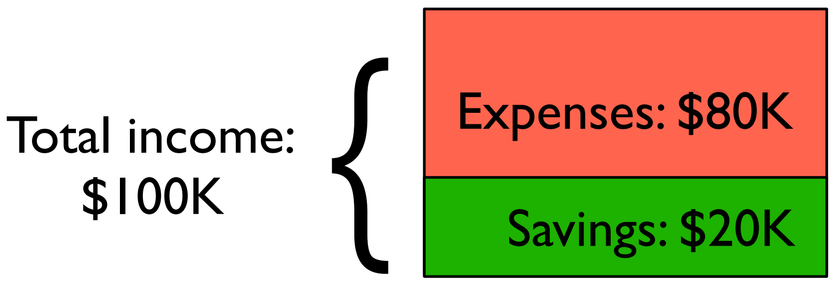
10% Savings Rate



Needed Assets: $2.25M

Time needed (8% investment return): **39 years**

10% Savings Rate



Needed Assets: $2M

Time needed (8% investment return): **29 years**

Other Savings Rates

Savings Rate	# of years for FI (asume 8% return)
10%	39
20%	29
30%	23
40%	19
50%	15
60%	12
70%	9
80%	6
90%	3

Tools

Negotiate Your Job Offer!

Don't accept the first offer

Negotiate on:

- Annual salary
- Signing bonus
- Stock/Option grants
- Moving expenses

Best negotiating position: having multiple offers

Don’t Increase your Lifestyle

Don’t buy/lease a new car

Continue to have roommates

Increase your spending by only X% of increased income

- For example, if you get a raise of $500/month, increase your spending budget by only $100/month

Be (a)ware of *hedonic adaptation*

The Rule of 72

How long to double your money? *Calculate n*

Depends on annual interest rate. *Given i*

$$n = \frac{72}{i}$$

Interest rate	Number of years
2%	$\frac{72}{2} =$ **36**
6%	$\frac{72}{6} =$ **12**
9%	$\frac{72}{9} =$ **8**
12%	$\frac{72}{12} =$ **6**

Approximation first in print in 1494—see Wikipedia article for details

Budgeting (YNAB)

YNAB: Great budgeting software

Free for students!

Four rules:

- Give every dollar a job
- Save for a rainy day
- Roll with the punches
- Live on last month's income

Comparison:

- Quicken/Mint—Capture historical record
- YNAB—Plan the future

Best Checking Account

Features

- ATM Fee Rebates (domestic and international)
- No-fee, no-minimum
- Mobile deposits
- Bill-pay
- 0.4% interest :(
- 2FA (with hardware token or mobile app)
- Debit card: no foreign transaction fees

Best Cash-back Credit Card

Features:

- 2% cash-back each month (deposited into a Fidelity brokerage account)

Insurance you must have

Disability: often provided by employer*

Life: some may provided by employer*

Umbrella: you need!

Health: usually provided by employer

* If FI, you can self-insure

Umbrella Insurance

Sits on top of homeowners (or renters) and auto.

Protects against excess liability (plus slander, libel, false imprisonment!)

Provides protection up to $1M (or more). Cheap. $400/yr for $1M ($500/yr for $2M). YMMV

How much to have? At a minimum, enough so that the insurance company puts up a strong defense

But what if I have a low net worth? Doesn't matter: you have a high future income potential

Cash Reserves (aka *Emergency Fund*)

Maintain 3-6 months of (bare-bones) living expenses

- CDs
- Money Market
- Savings Account
- I-Bonds

Not good enough to rely on:

- Credit cards
- HELOC (Home Equity Line of Credit)
- Investments

This money is insurance; not an investment

Use Tax-advantaged Accounts

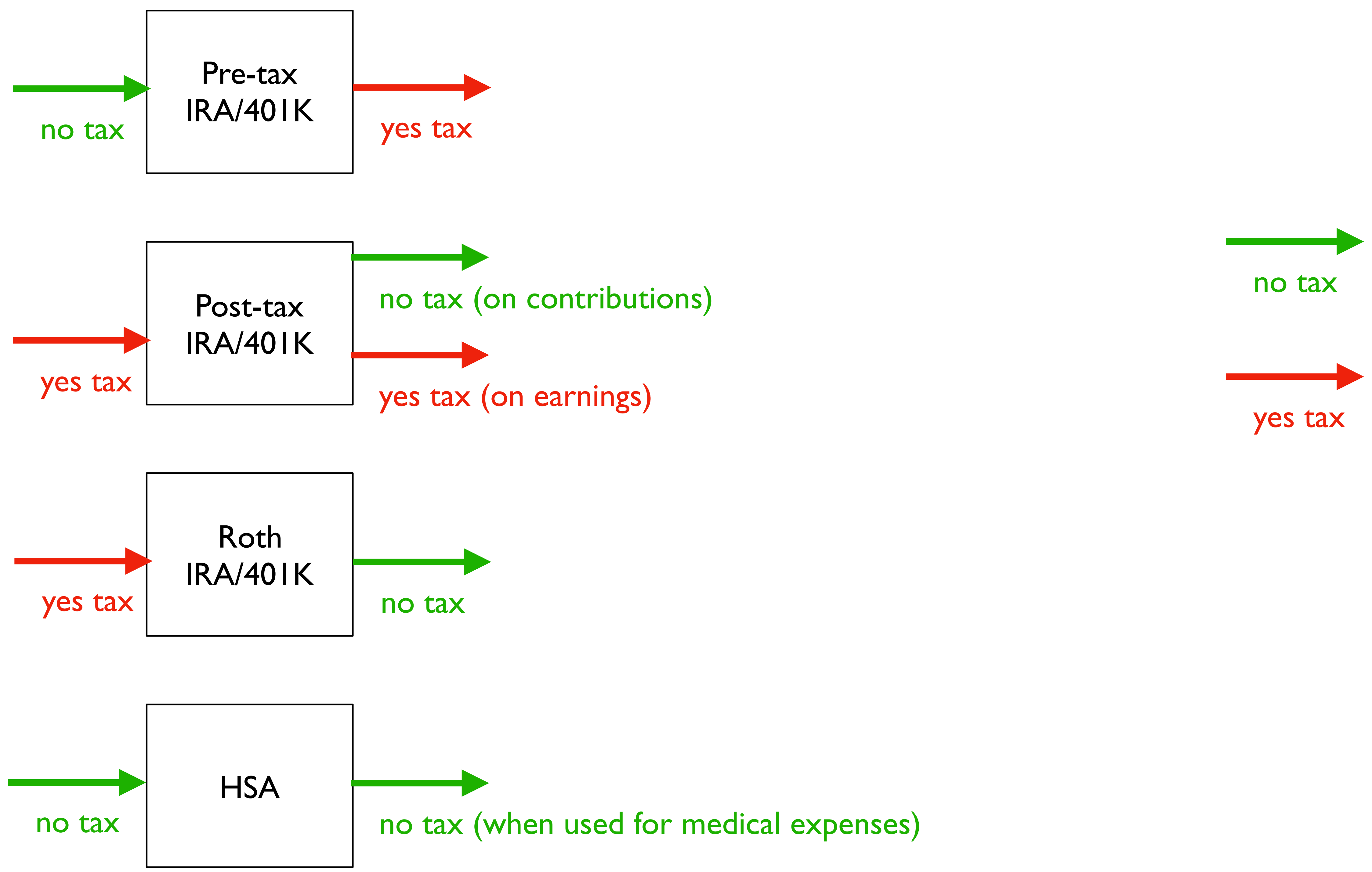
Per year:

$56,000: 401K (includes $19K pre-tax +
? company match +
remainder post-tax)
$ 6,000: Backdoor Roth IRA*
$ 3,500: HSA ($7,000 for family)

$**65,500**: Total tax-advantaged savings

* Double that if you have a working spous

Tax-Advantaged Accounts



Getting Money Out (Without Penalty)

After leave your company

- Rollover pre-tax 401K to traditional IRA
- Rollover Roth 401k to Roth IRA

Three ways to get money out of traditional IRA ≤59½ without penalty:

- Exceptions: Medical expenses ≥10% of income, college expenses (even if paid from 529!), first time homebuyer (≤10K lifetime, therefore useless)
- Substantially Equal Periodic Payments (SEPP aka 72t)
- Conversions to Roth IRA

Getting Money Out (SEPP)

Withdraw money over your lifetime (substantially equal periodic payments):

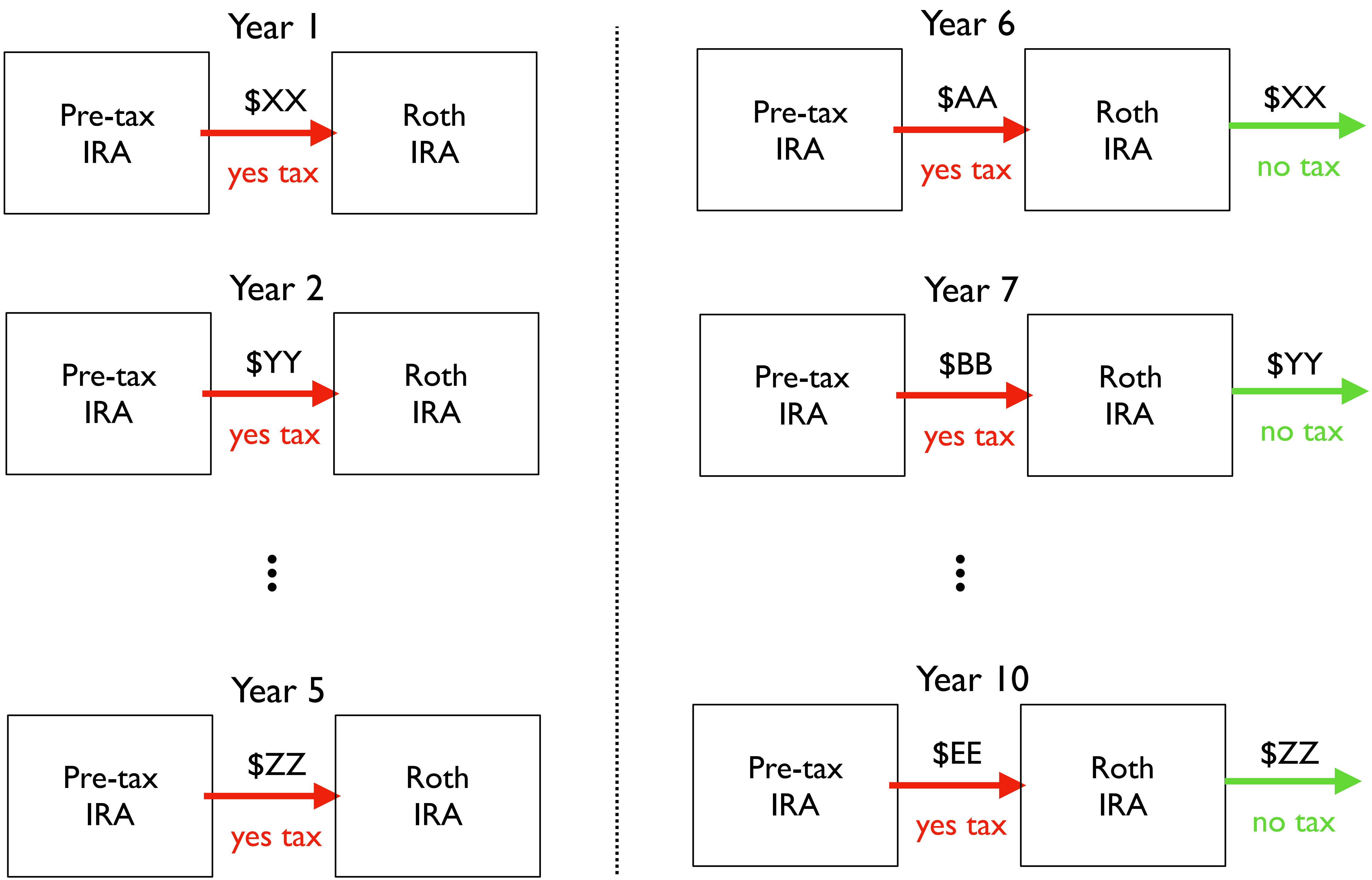
Three options:

- Simple formula: $\frac{\text{IRA Balance}}{\text{life expectancy}}$ recalculated each year
- Amortized (like a mortgage): one-time calculation using IRA balance and life expectancy, and Fed mid-term interest rate
- Recalculated amortized (not official, but allowed by several PLRs): Each year, recalculate amortization using current IRA balance, life expectancy, and Fed mid-term interest rate

SEPP can operate on a subset of IRA accounts
SEPP must continue until age 59½ or 5 years, whichever is *longer*

Getting Money Out (Conversion to Roth)

Idea: conversions to Roth can be withdrawn tax-free after 5 years



Tax Rates without Earned Income

Married filing jointly: 12% up to taxable income of $77,400

In this tax bracket long-term capital gains (and qualified dividends) are taxed at 0%

25K in dividends

52K in capital gains

24K in IRA withdrawal

$101K income:

$0 federal tax

1	Wages, salaries, tips, etc. Attach Form(s) W-2			1	
2 a	**Tax-exempt** interest	2 a			
b	**Taxable** interest			2 b	
3 a	Qualified dividends	3 a	25,000.		
b	Ordinary dividends			3 b	25,000.
4 a	IRAs, pensions, and annuities	4 a			
b	Taxable amount			4 b	24,000.
5 a	Social security benefits	5 a			
b	Taxable amount			5 b	
6	Total income. Add lines 1 through 5. Add any amount from Schedule 1, line 22		52,000.	6	101,000.
7	Adjusted gross income. If you have no adjustments to income, enter the amount from line 6; otherwise, subtract Schedule 1, line 36, from line 6			7	101,000.
8	**Standard deduction or itemized deductions** (from Schedule A)			8	24,000.
	Standard Deduction for - • Single or Married filing separately: $12,000 • Married filing jointly or Qualifying widow(er): $24,000 • Head of household: $18,000 • If you checked any box under Standard deduction, see instructions.				
9	Qualified business income deduction (see instructions)			9	
10	Taxable income. Subtract lines 8 and 9 from line 7. If zero or less, enter -0-			10	77,000.
11 a	**Tax.** (see instructions) 0. Check if any from: 1 ☐ Form(s) 8814 2 ☐ Form 4972 3 ☐				
b	**Add** any amount from Schedule 2 and check here ▸ ☐			11	0.
12 a	Child tax credit/credit for other dependents				
b	**Add** any amount from Schedule 3 and check here ▸ ☐			12	
13	Subtract line 12 from line 11. If zero or less, enter -0-			13	0.
14	Other taxes. Attach Schedule 4			14	0.
15	Total tax. Add lines 13 and 14			15	0.

Hacking an HSA Account

HSA: tax-deductible contributions

tax-free withdrawals (if used for medical expenses)

Hack: can pay for *past* medical expenses, not just current

- Contribute max to HSA ($3,500)
- Pay this year's medical expenses ($XX) out of pocket
  - But, save your receipts!
- Let HSA grow in value (tax-free!) for 30 years
  - $3,500 has now become $31,000
  - Withdraw $XX tax free

Vested Stock

If you have a month with:

$X pay

$Y vested stock

From IRS standpoint, identical to:

$X + Y pay

You purchase $Y company stock

Is $Y company stock the exact right amount for you to hold?

Treat income as $X + Y and decide separately how to invest

Passively not selling company stock when it vests is the same as actively deciding to buy it

Holding Company Stock Considered Harmful

Diversify!

Future vesting income already dependent on company future

Future employment may be dependent on company future

Don’t put all your eggs in one basket (perhaps even diversify away from tech stocks)

Resources

Blogs

- Mr. Money Mustache
- Early Retirement Extreme
- Mad Fientist

Podcasts

- Radical Personal Finance

Website

- 72t.net (SEPP)