And now for something completely different

Optimize your Financial Life

Based on internal talks I gave at Google
Outline

Optimize your Financial Life

• FI

• Tools

• Resources

Optimize your Engineering Life

• General

• Meta-Optimizations
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/small science & engineering private college
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:

\[
\text{needed assets} = 25 \times \text{desired annual income}
\]
FI is *independent* of income!

What is it dependent on? *Savings rate*

\[
\text{Total income} = \begin{cases} 
\text{Expenses} \\
\text{Savings}
\end{cases}
\]

\[X \text{ Safe withdrawal rate} = \begin{cases} 
<? \\
>?
\end{cases}
\]
10% Savings Rate

Needed Assets: $2.25M

Time needed (8% investment return): 39 years
Increase to 20% Savings Rate

Needed Assets: $2M

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

Total income: $100K

Expenses: $80K

Savings: $20K
## Other Savings Rates

<table>
<thead>
<tr>
<th>Savings Rate</th>
<th># of years for FI (assume 8% return)</th>
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<tbody>
<tr>
<td>10%</td>
<td>39</td>
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<tr>
<td>20%</td>
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<td>30%</td>
<td>23</td>
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<td>40%</td>
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<td>60%</td>
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<td>70%</td>
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<td>80%</td>
<td>6</td>
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<td>90%</td>
<td>3</td>
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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 $i$

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

<table>
<thead>
<tr>
<th>Interest rate</th>
<th>Number of years</th>
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<tbody>
<tr>
<td>2%</td>
<td>$\frac{72}{2} = 36$</td>
</tr>
<tr>
<td>6%</td>
<td>$\frac{72}{6} = 12$</td>
</tr>
<tr>
<td>9%</td>
<td>$\frac{72}{9} = 8$</td>
</tr>
<tr>
<td>12%</td>
<td>$\frac{72}{12} = 6$</td>
</tr>
</tbody>
</table>

Approximation first in print in 1494—see Wikipedia article for details
Budgeting (YNAB)

YNAB: Great budgeting software

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

Free for students!
Best Checking Account

Features

• ATM Fee Rebates (domestic and international)
• No-fee, no-minimum
• Mobile deposits
• Bill-pay
• 0.18% interest :(
• 2FA (with hardware token or mobile app)
• Debit card: no foreign transaction fees

Absolutely free ATM!
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:

$57,000: 401K (includes $19.5K pre-tax + company match + remainder post-tax*)

$  6,000: Backdoor Roth IRA**

$  3,550: HSA ($7,100 for family)

$66,560: Total tax-advantaged savings

* Backdoor that allows you to convert post-tax 401K to Roth IRA regardless of income limits

** Backdoor allows you to effectively contribute to Roth IRA regardless of income limits
Tax-Advantaged Accounts

- **Pre-tax IRA/401K**
  - Yes tax (on contributions)
  - No tax (on earnings)

- **Post-tax IRA/401K**
  - No tax (on contributions)
  - Yes tax (on earnings)

- **Roth IRA/401K**
  - No tax

- **HSA**
  - No tax (when used for medical expenses)
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

- Year 1: Pre-tax IRA to Roth IRA
  - $XX
  - yes tax

- Year 2: Pre-tax IRA to Roth IRA
  - $YY
  - yes tax

- Year 5: Pre-tax IRA to Roth IRA
  - $ZZ
  - yes tax

- Year 6: Pre-tax IRA to Roth IRA
  - $AA
  - no tax

- Year 7: Pre-tax IRA to Roth IRA
  - $BB
  - no tax

- Year 10: Pre-tax IRA to Roth IRA
  - $EE
  - no tax

- Year 11: Pre-tax IRA to Roth IRA
  - $ZZ
  - no tax
Tax Rates without Earned Income

Married filing jointly: 12% tax bracket (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/ conversion

$101K income: $0 federal tax
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 27 years
  - $3,500 has now become $28,000
  - 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
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
- 72tnet.com (SEPP)