

Two Funds for Life
Pre & Post-
Retirement
-- Chris Pedersen



**The Merriman
Financial Education
Foundation**

Two Funds for Life Pre & Post Retirement

- One fund for life -- Target Date Funds
- How a second fund can help young investors
- What about FIRE?
- What about retirees?
- Ways to test your plan
- Loose ends and next steps

Target Date Funds >\$1.7 Trillion

- >77% of investors hold TDFs in retirement accounts
- >50% of Vanguard participants have 100% in TDF
- ~37% of TDF market in Vanguard funds

Sources:

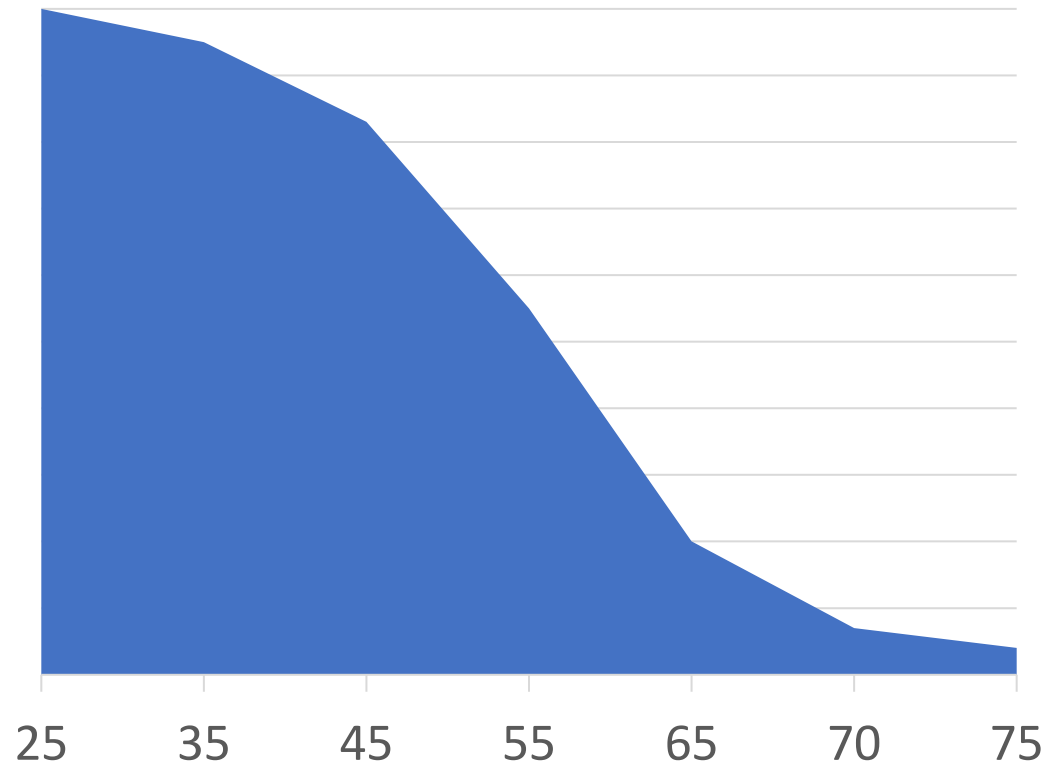
“How America Saves 2019” from Vanguard

“2019 Target-Date Fund Landscape” from Morningstar

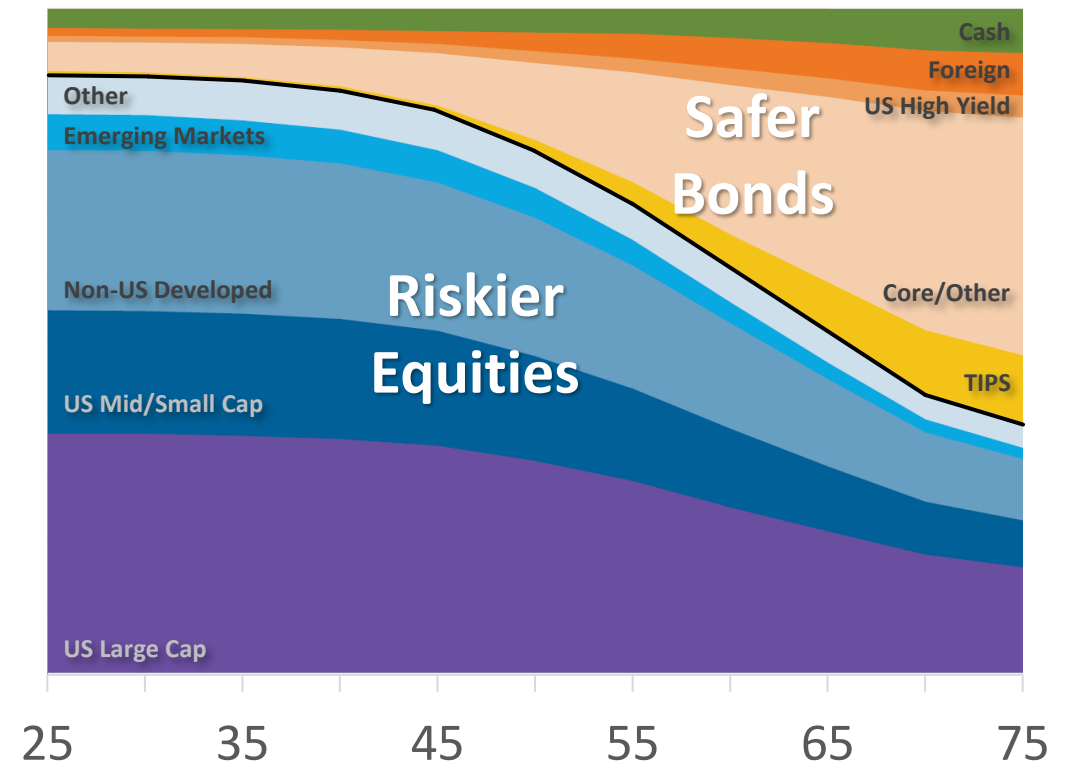


Human Capital & Target Date Funds (TDFs)

Human Capital vs. Age



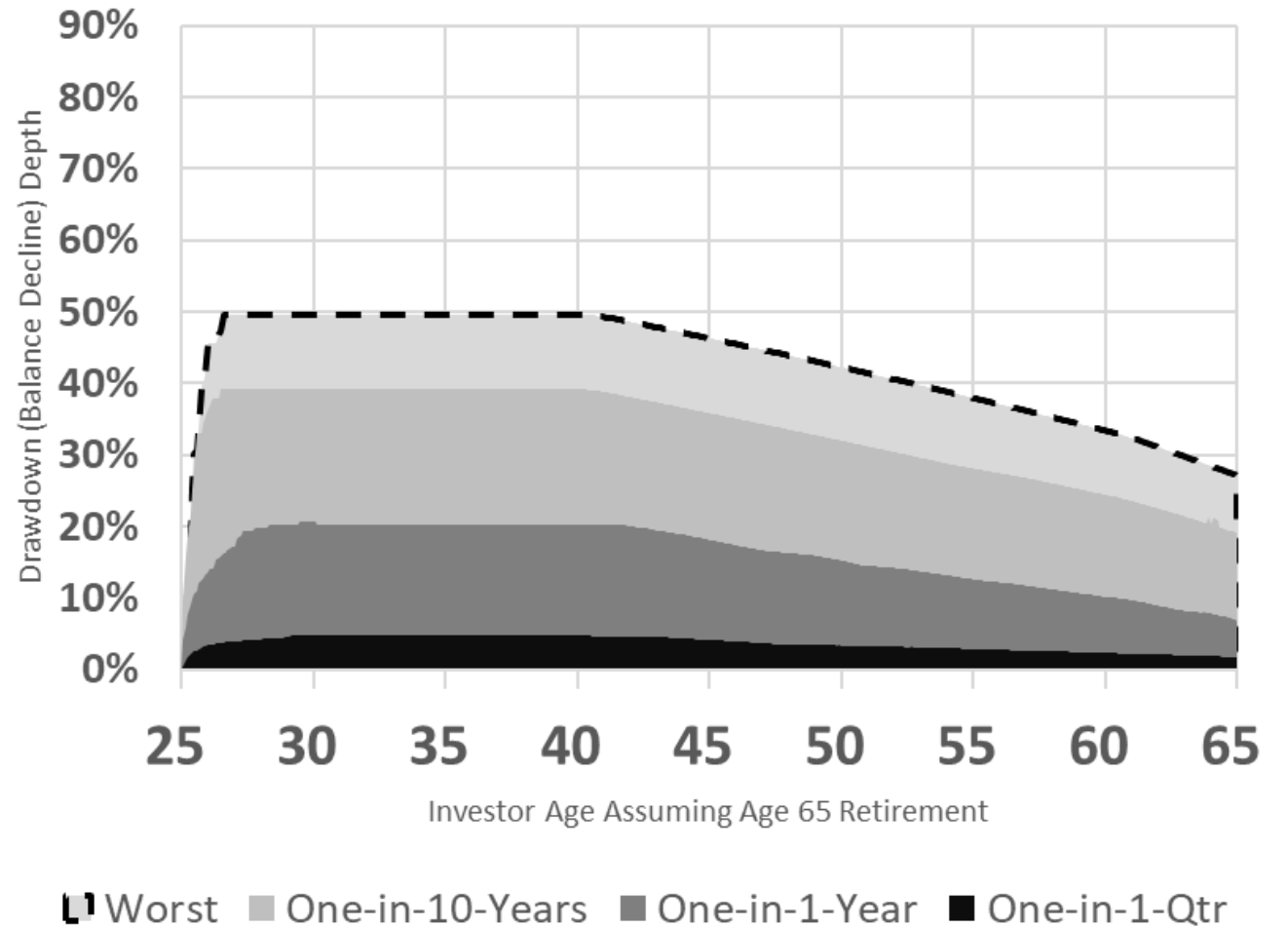
Industry Average TDF Glidepath



Sources: Morningstar 2015 Target-Date Fund Landscape & 2013 Target-Date Series Research Paper

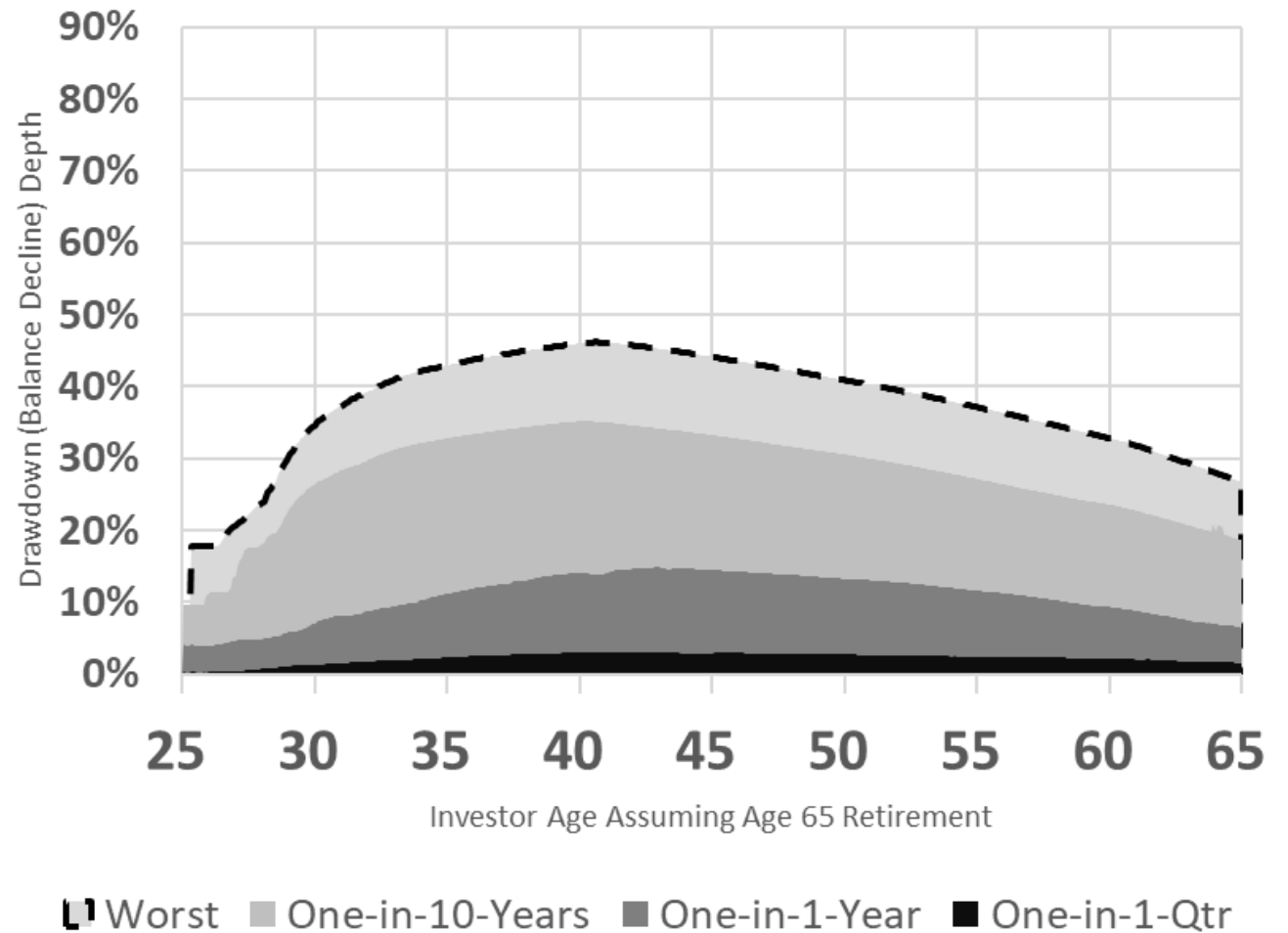
How well do they work?

Drawdown Depth vs. Age for Lump Sum Investment
(based on 1970-2017 historical returns)

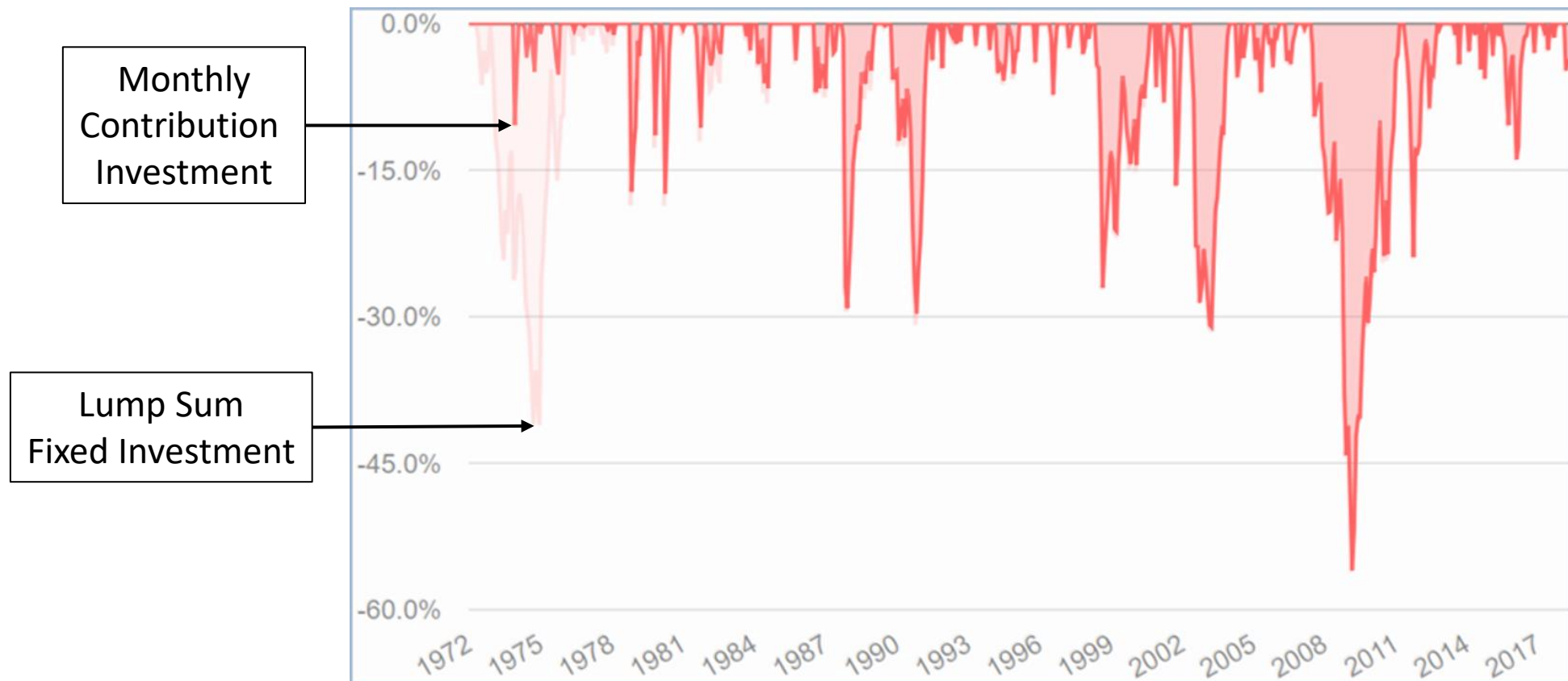


How well do
they work for
young
portfolios?

Drawdown Depth vs. Age for Monthly Investing
(based on 1970-2017 historical returns)



Early Drawdowns Are Reduced by Contributions



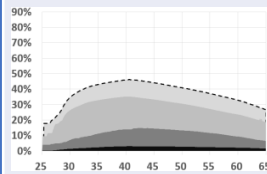
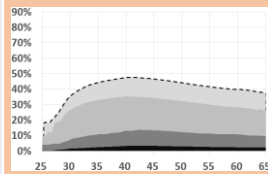
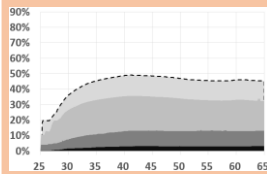
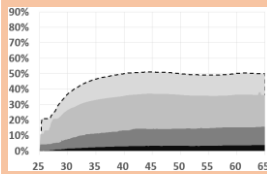
All small cap value portfolio balance backtested with and without annual contributions at www.portfoliovisualizer.com

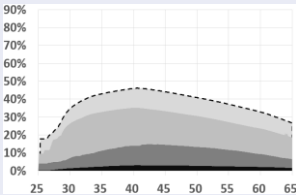
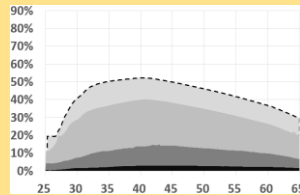
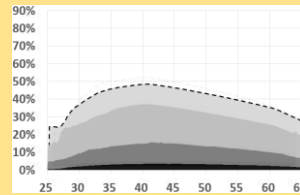
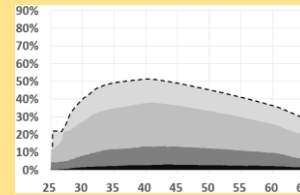
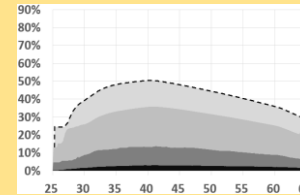
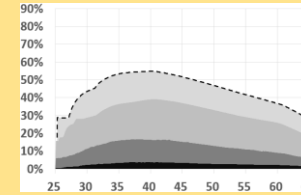


Putting bonds in
a young portfolio
is like ...

How could we improve?

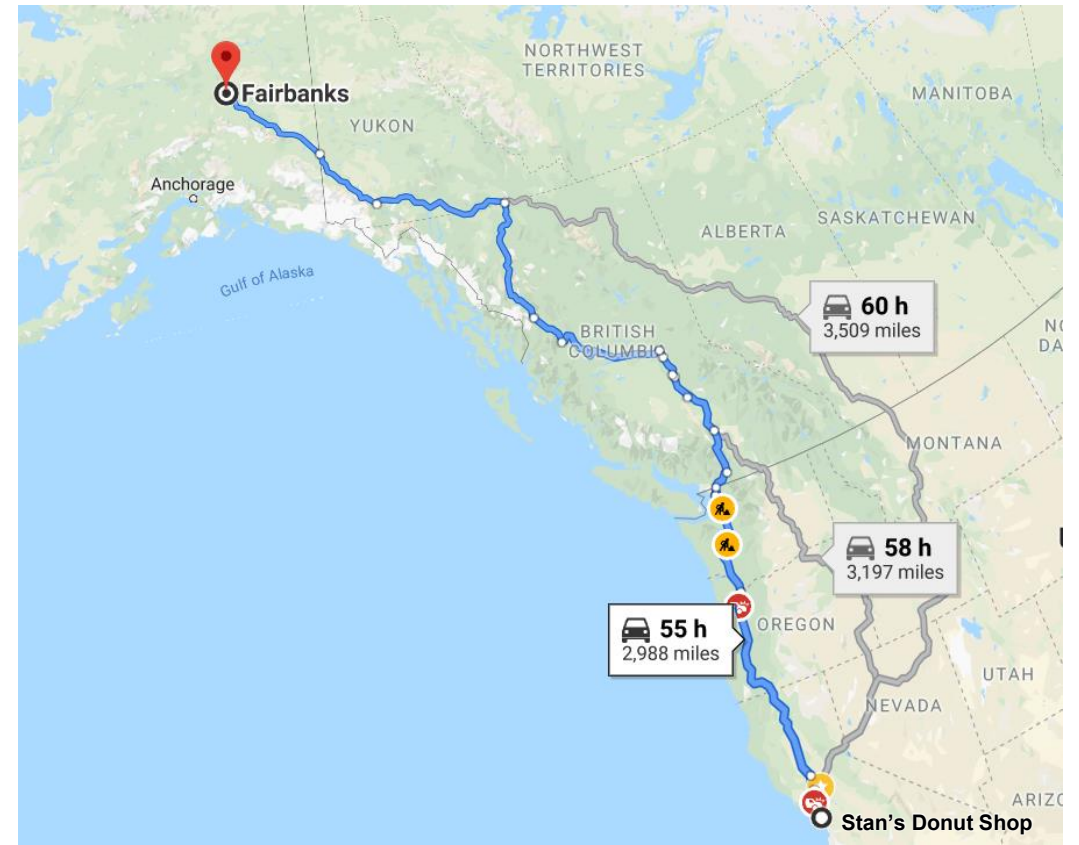
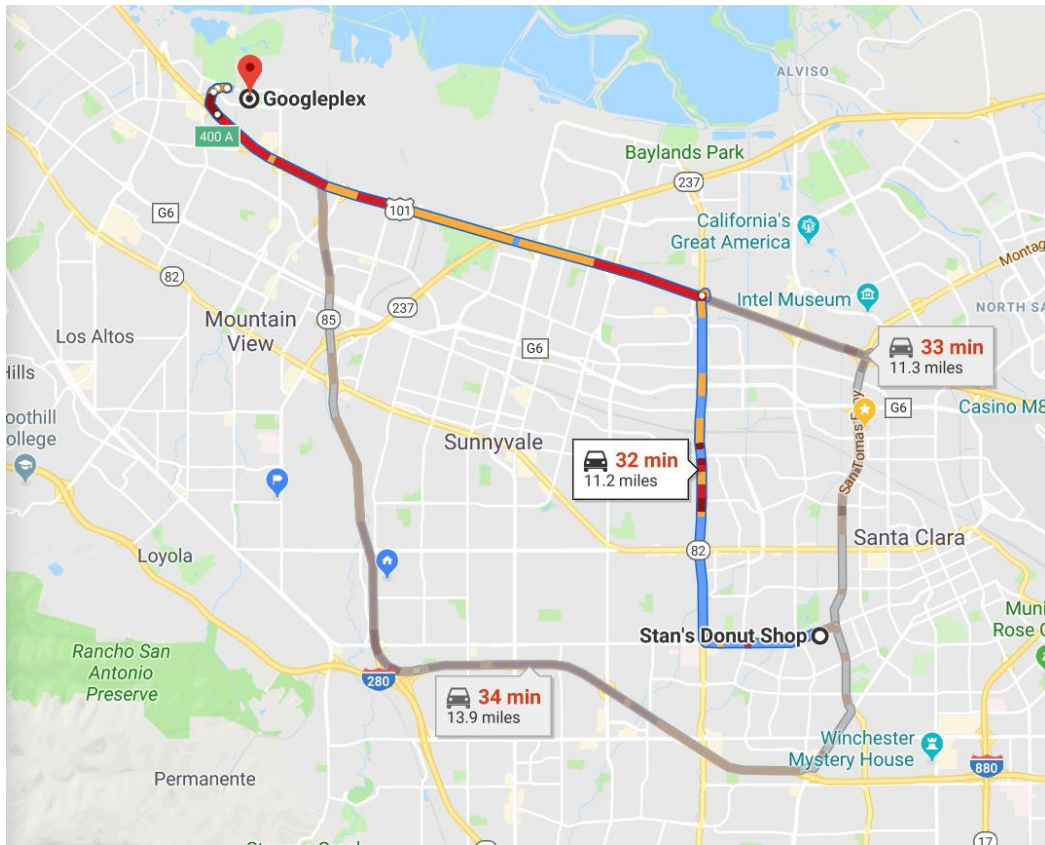
Invest a bit in a higher risk-reward asset class such as small-cap value (SCV)

	Vanguard-like Target Date Fund (Baseline TDF)	90% TDF plus 10% US SCV	80% TDF plus 20% US SCV	70% TDF plus 30% US SCV
Rebalancing	Monthly	None – for second fund could be in different account		
End Balance Range (\$10k/yr + inflation for 40 years)	\$12.8 M \$7.93 M \$3.49 M	\$18.21 M \$10.31 M \$3.90 M	\$23.98 M \$12.68 M \$4.24 M	\$29.74 M \$15.06 M \$4.53 M
Inflation-Adjusted End Balances	\$2.36 M \$1.61 M \$0.72 M	\$3.19 M \$2.09 M \$1.02 M	\$4.20 M \$2.56 M \$1.22 M	\$5.21 M \$3.03 M \$1.30 M
Worst Drawdown	46%	48%	49%	51%
Age 65 Worst DD	26%	37%	45%	50%
Drawdown Risk versus Age				
<div> ■ One-in-90 Year ■ One-in-10-Years ■ One-in-1-Year ■ One-in-1-Qtr </div>				

	Vanguard-like Target Date Fund (Baseline TDF)	1.5 X Age = % in TDF Rest in <u>US LCV</u>	1.5% X Age = % in TDF Rest in <u>US SC</u>	1.5% X Age = % in TDF Rest <u>US LCV SCV</u>	1.5% X Age = % in TDF Rest in <u>US SCV</u>	2.5 X (Age-25) = % TDF Rest in <u>US SCV</u>
Rebalancing	Monthly	Monthly				
End Balance Range (\$10k/yr + inflation for 40 years)	\$12.8 M \$7.93 M \$3.49 M	\$16.24 M \$9.80 M \$4.26 M	\$15.38 M \$9.55 M \$4.01 M	\$17.50 M \$10.63 M \$4.56M	\$18.79 M \$11.50 M \$4.79 M	\$22.83 M \$13.83M \$5.64 M
Inflation-Adjusted End Balances	\$2.36 M \$1.61 M \$0.72 M	\$2.97 M \$1.99 M \$0.88 M	\$2.72M \$1.94 M \$0.94 M	\$3.11 M \$2.16 M \$0.99 M	\$3.26 M \$2.33 M \$1.11 M	\$4.02 M \$2.80 M \$1.39 M
Worst Drawdown	46%	52%	48%	51%	50%	55%
Age 65 Worst DD	26%	29%	27%	28%	28%	27%
Drawdown Risk versus Age						

Could we do even better?

Scale higher risk-reward asset class with age so TDF is ~100% at age 65



What's the catch?

What about FIRE? Financial Independence Retire Early

Years to Retirement X 1.5 = % for the 2nd fund

Example:

You're 30 retiring @ age 50

You have 20 yrs left

$20 \times 1.5 = 30$

Put 30% in 2cd fund

Put 70% in TDF



What if I'm already retired?!

It depends



> 4% / Year – Under Saved
~4% / Year – Just Right
< 4% / Year – Over Saved



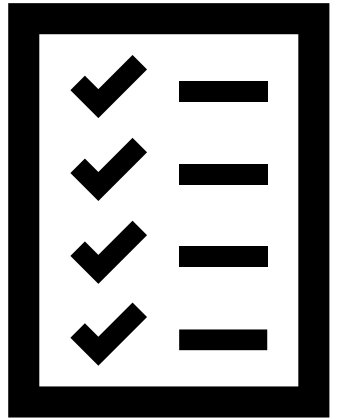
Raise or Lower Expenses
& You Change
Withdrawal Rate



Withdrawals



Expenses



Savings, Income, Expenses, Withdrawals

They interact

Two Fund for Life Options in Retirement

If withdrawal rate is $> 4\%$ /year, see a financial planner

If withdrawal rate is $\sim 4\%$ /year, 100% TDF is likely fine -- consider adding a 2nd equity fund over time

If withdrawal rate is $< 4\%$ /year, you could spend more, or put “extra” in 2nd equity fund for legacy



Why ramp 2nd fund down, then up?

What can we expect?

“Test as you fly,
fly as you test”

-- NASA



Testing Retirement Scenarios with Portfolio Visualizer

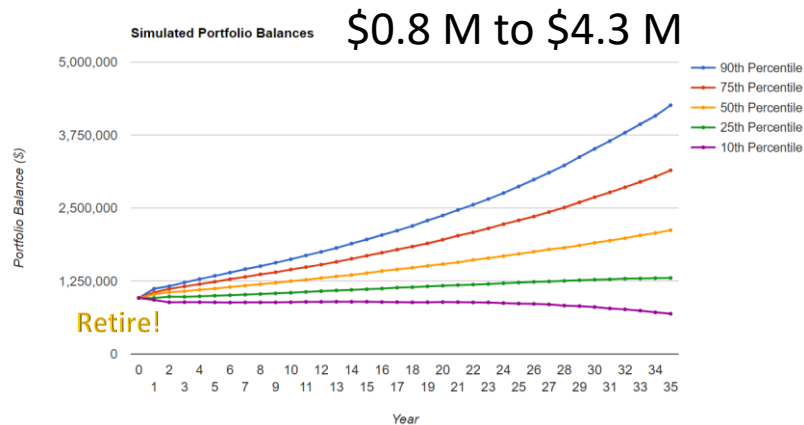
- It's free
- “Financial Goals” tool can model TDF allocations in retirement
 - Select Multistage Planning Type
 - Enter 7 Years to Retirement even though scenario is in retirement
 - Enter starting portfolio allocation to match TDF allocation at start
 - Enter ending portfolio allocation to match final TDF allocation
 - Enter withdrawal model in Financial Goals section
 - Click “Run Simulation”

The screenshot shows the Portfolio Visualizer website. The header includes the site name "PORTFOLIO VISUALIZER" and navigation links for Examples, FAQ, Contact, Tools, Register, and Login. Below the header, a large banner features the site name and a description of its capabilities: "Portfolio Visualizer provides online portfolio analysis tools for backtesting, Monte Carlo simulation, tactical asset allocation and optimization, and investment analysis tools for exploring factor regressions, correlations and efficient frontiers." A green button labeled "VIEW EXAMPLES »" is positioned below the banner. The main content area is divided into six sections, each with a circular icon and a list of tools:

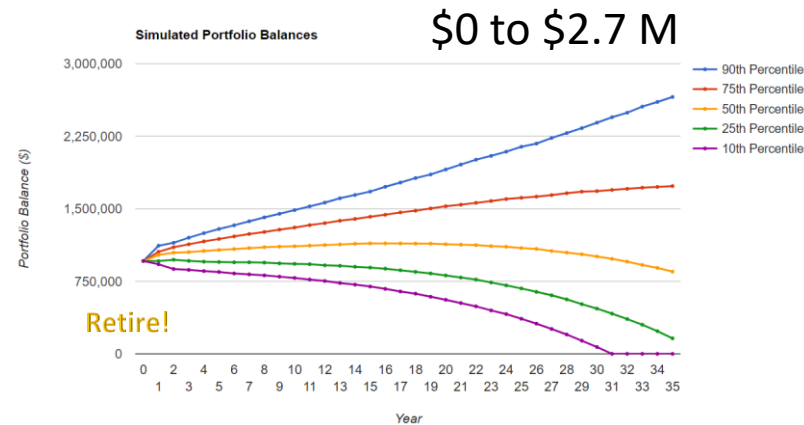
- Backtest Portfolio** (Pie chart icon):
 - Backtest a portfolio asset allocation and compare historical and realized returns and risk characteristics against various lazy portfolios.
 - [Backtest Asset Allocation »](#)
 - [Backtest Portfolio »](#)
 - [Backtest Dynamic Allocation »](#)
- Factor Analysis** (Cube icon):
 - Run regression analysis using Fama-French and Carhart factor models for individual assets or a portfolio to analyze returns against market, size, value and momentum factors.
 - [Factor Regression »](#)
 - [Risk Factor Allocation »](#)
 - [Match Factor Exposures »](#)
 - [Principal Component Analysis »](#)
 - [Factor Statistics »](#)
 - [Fund Factor Regressions »](#)
 - [Fund Performance Attribution »](#)
- Asset Analytics** (Crossed arrows icon):
 - Find funds based on asset class, style and risk adjusted performance, and analyze asset correlations.
 - [Fund Screener »](#)
 - [Fund Performance »](#)
 - [Asset Correlations »](#)
 - [Asset Class Correlations »](#)
 - [Asset Autocorrelation »](#)
 - [Asset Cointegration »](#)
- Monte Carlo Simulation** (Line graph icon):
 - Run Monte Carlo simulations for the specified portfolio based on historical or forecasted returns to test long term expected portfolio growth and survival, and the capability to meet financial goals and liabilities.
 - [Monte Carlo Simulation »](#)
 - [Financial Goals »](#)
 - [Asset Liability Modeling »](#)
- Portfolio Optimization** (Target icon):
 - Chart the efficient frontier to explore risk vs. return trade-offs based on historical or forecasted returns. Optimize portfolios based on mean-variance, conditional value-at-risk (CVaR), risk-return ratios, or drawdowns. Apply the Black-Litterman model to find the optimal portfolio based on market views.
 - [Historical Efficient Frontier »](#)
 - [Forecasted Efficient Frontier »](#)
 - [Portfolio Optimization »](#)
 - [Black-Litterman Model »](#)
 - [Rolling Optimization »](#)
- Timing Models** (Circular arrow icon):
 - Compare and test market timing models based on moving averages, momentum, the Shiller PE ratio valuation, and target volatility.
 - [Market Valuation »](#)
 - [Moving Averages »](#)
 - [Momentum Rotation »](#)
 - [Dual Momentum »](#)
 - [Adaptive Allocation »](#)
 - [Target Volatility »](#)
 - [Core-Satellite »](#)

100% TDF w/ *fixed* withdrawals in retirement

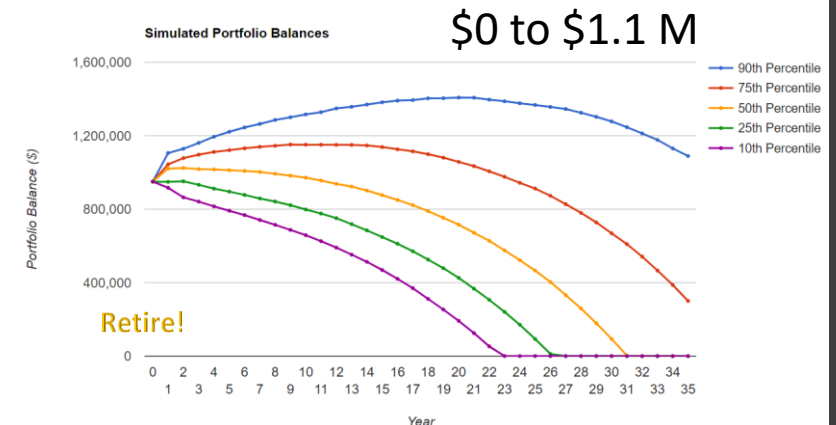
Portfolio Visualizer (4% fixed example at <https://bit.ly/2mr1Wqg>)



**3% Fixed
Withdrawal Rate**



**4% Fixed
Withdrawal Rate**



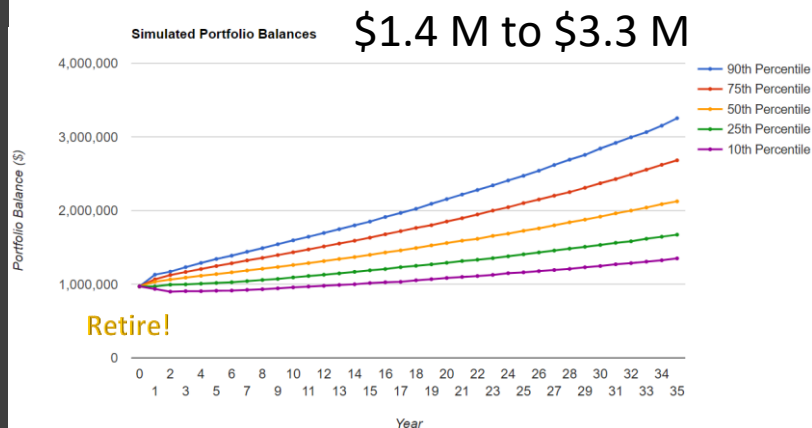
**5% Fixed
Withdrawal Rate**

Only 34% make it all the way to 35 years

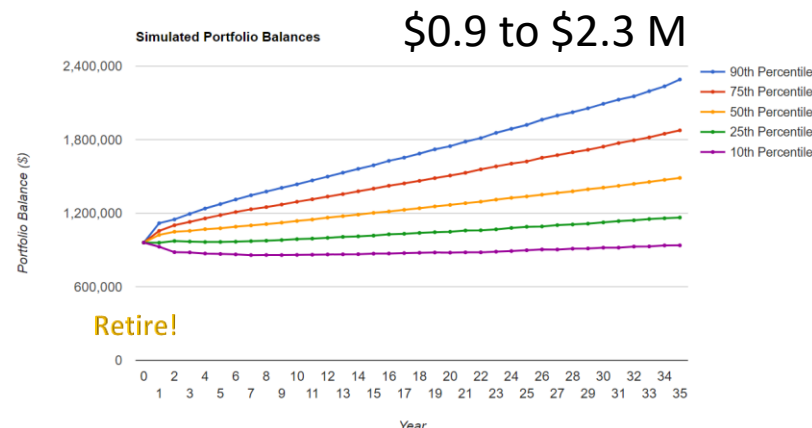
Assumes \$1M minus first withdrawal as starting balance at retirement, 35 years in retirement, and Vanguard-like TDF asset allocation glidepath. Fixed withdrawal dollar amount calculated as percent of balance at start of retirement and is then kept fixed except for increases to match inflation.

100% TDF w/ *variable* withdrawals in retirement

Portfolio Visualizer (4% variable example at <https://bit.ly/2mpTkQK>)

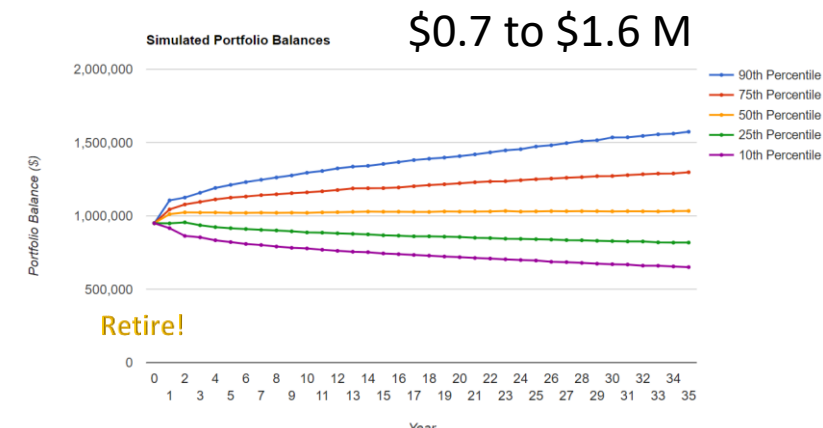


**3% Variable
Withdrawal Rate**



**4% Variable
Withdrawal Rate**

Inflation-adjusted value of withdrawals
declines by 27% over 35-year retirement



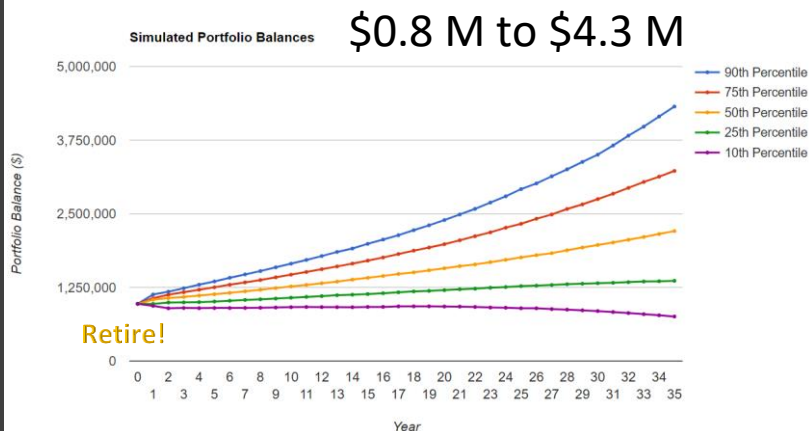
**5% Variable
Withdrawal Rate**

Inflation-adjusted value of withdrawals
declines by 49% over 35-year retirement

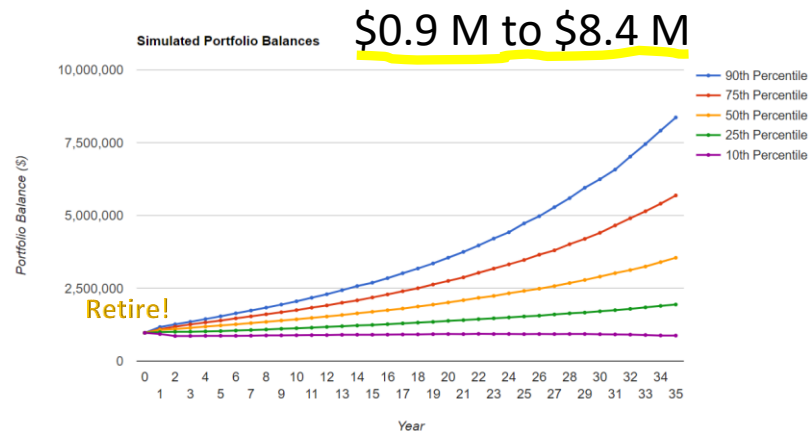
Assumes \$1M minus first withdrawal as starting balance at retirement, 35 years in retirement, and Vanguard-like TDF asset allocation glidepath. Variable withdrawal dollar amount calculated as percent of balance at start of each year in retirement, so dollar amount withdrawn varies year-to-year based on investment returns and independent of inflation.

TDF + Value Fund Options for Over-Savers

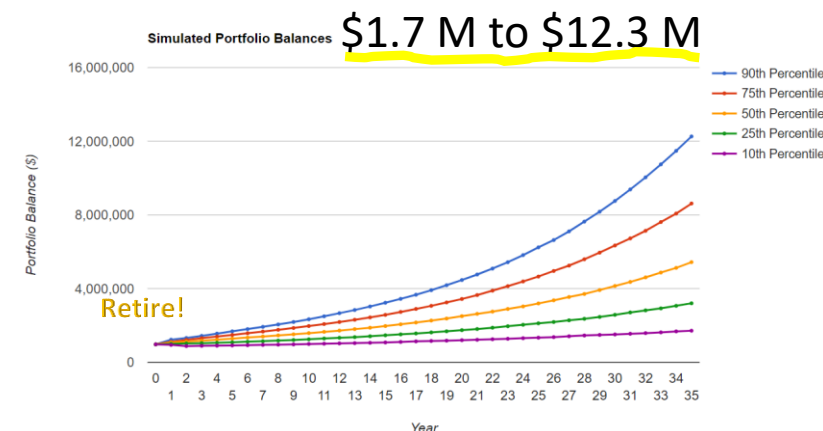
Portfolio Visualizer (75% TDF | 25% SCV example at <https://bit.ly/2mlcRBD>)



\$30k (3%) Fixed
Withdrawal Rate
100% TDF



\$30k (3%) Fixed
Withdrawal Rate
75% TDF | 25% LCV

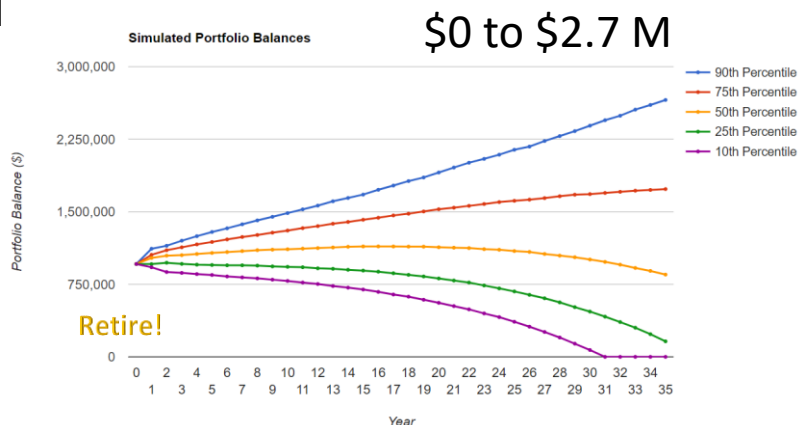


\$30k (3%) Fixed
Withdrawal Rate
75% TDF | 25% SCV

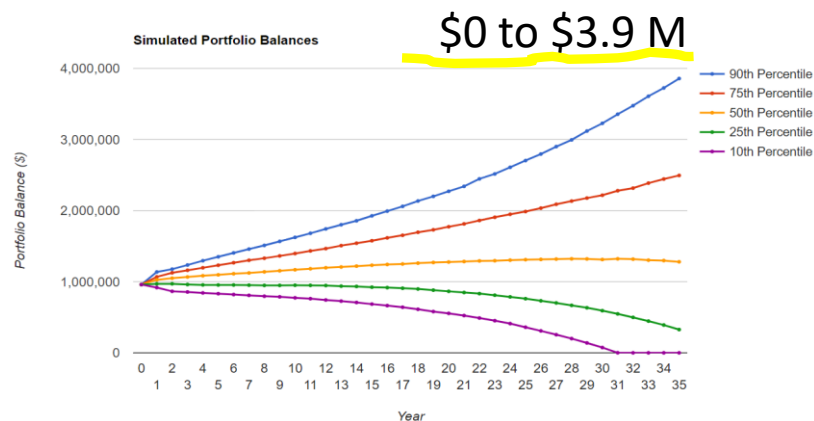
Assumes \$1M minus first withdrawal as starting balance at retirement, 35 years in retirement, and Vanguard-like TDF asset allocation glidepath. Fixed withdrawal dollar amount calculated as percent of balance at start of retirement and is then kept fixed except for increases to match inflation.

TDF + Small-Cap-Value for “Just Enough” Savers

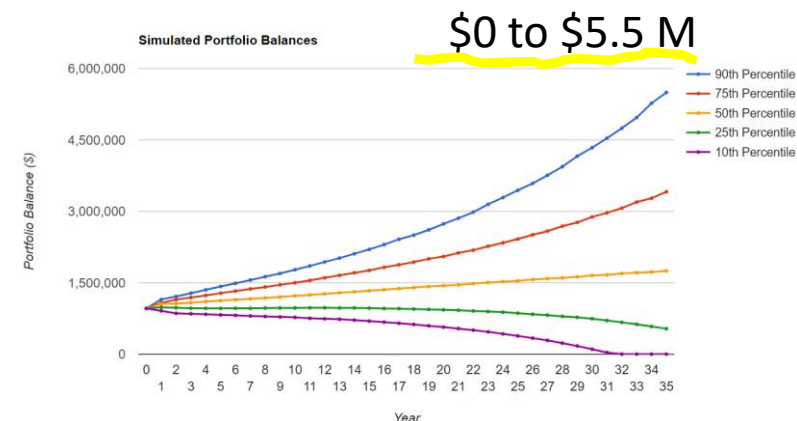
Portfolio Visualizer (4% fixed 80|20 example at <https://bit.ly/2m8eKBR>)



**4% Fixed
Withdrawal Rate
100% TDF**



**4% Fixed
Withdrawal Rate
90% TDF | 10% SCV**



**4% Fixed
Withdrawal Rate
80% TDF | 20% SCV**

Assumes \$1M minus first withdrawal as starting balance at retirement, 35 years in retirement, and Vanguard-like TDF asset allocation glidepath. Fixed withdrawal dollar amount calculated as percent of balance at start of retirement and is then kept fixed except for increases to match inflation.

Loose Ends

Question	Answer
Which specific second fund should I use?	Recommendations for mutual funds and Best in Class ETFs at www.paulmerriman.com
Could I use just a few more funds to get more diversification?	Sure! E.g. US SCV + Intl. SCV + EM
Can I use Portfolio Visualizer to model target date funds in contribution years?	Not yet.
What's the biggest risk with this strategy?	Portfolio suicide – losing hope and selling when the market is down.
What if I don't care about complexity and want the "Ultimate" TDF?	Read about the Merriman Aggressive TDF Glide Path & Calculator

Call to Action

Recognize

The resilience of young portfolios!

Consider

Two Funds for Life Strategy in your working years

Calculate

Withdrawal rate & consider two funds in retirement

Test

Your plan, set expectations, then stick with it!

Helpful links

www.portfoliovisualizer.com

www.paulmerriman.com

www.2fundsforlife.com

<https://paulmerriman.com/the-ultimate-target-date-fund-portfolio/>

<https://paulmerriman.com/best-in-class-etfs-for-the-ultimate-buy-and-hold-2019/>

<https://www.aqr.com/Insights/Podcasts/The-Curious-Investor/Season-Two/Calculated-Risks> (fly as you test, test as you fly ...)