

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



**The Merriman  
Financial Education  
Foundation**

# 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:

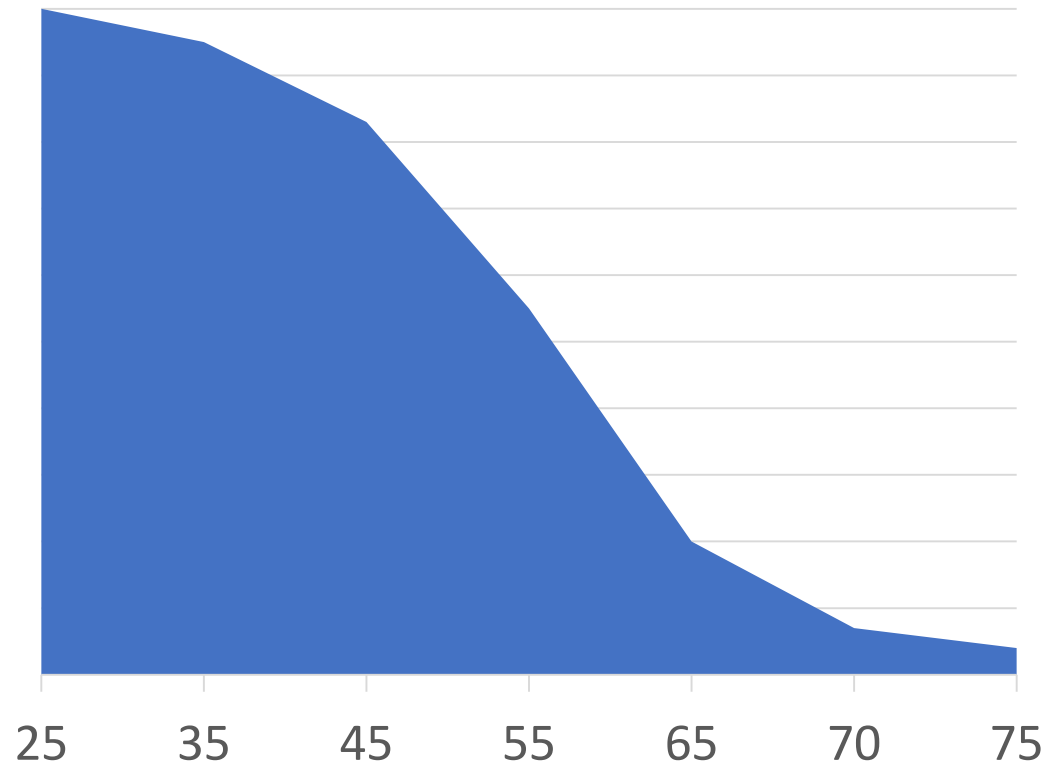
“How America Saves 2019” from Vanguard

“2019 Target-Date Fund Landscape” from Morningstar

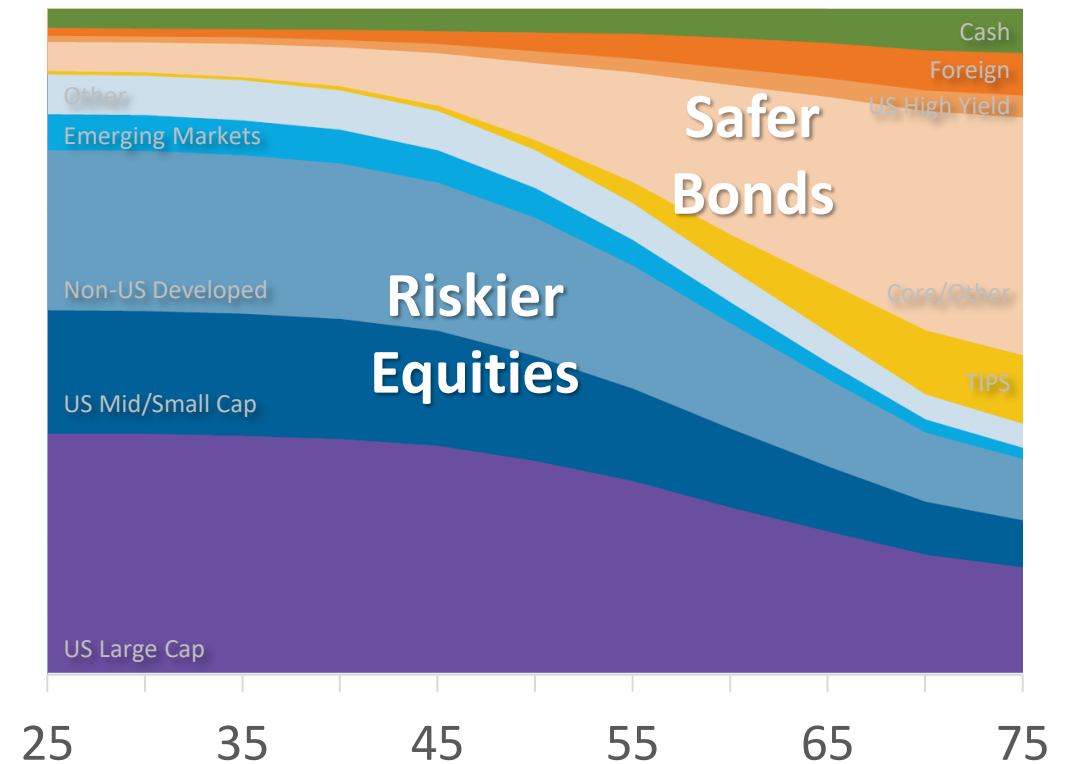


# Human Capital & Target Date Funds (TDFs)

Human Capital vs. Age



Industry Average TDF Glidepath

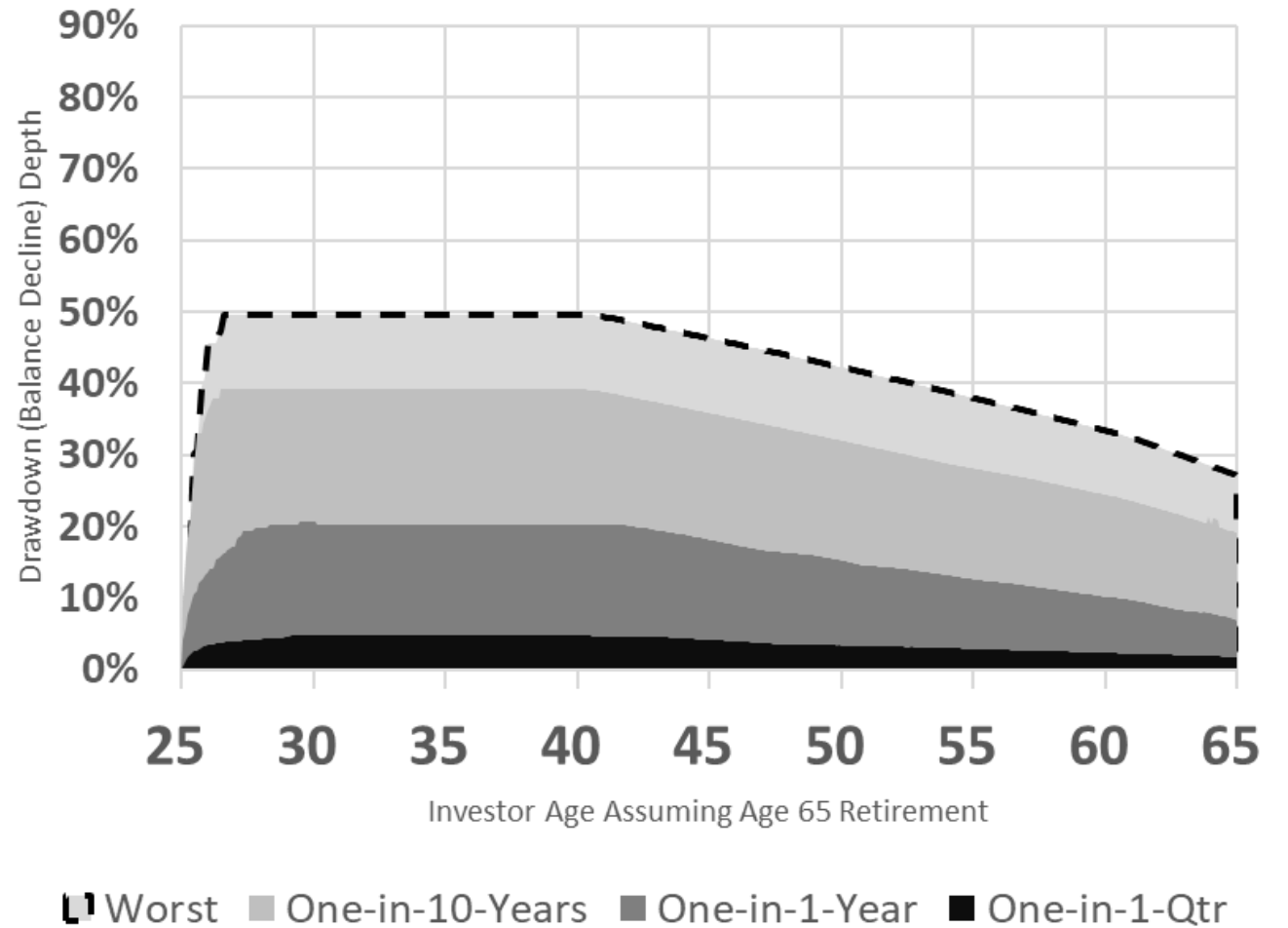


Sources: Morningstar 2015 Target-Date Fund Landscape & 2013 Target-Date Series Research Paper

# How well do they work?

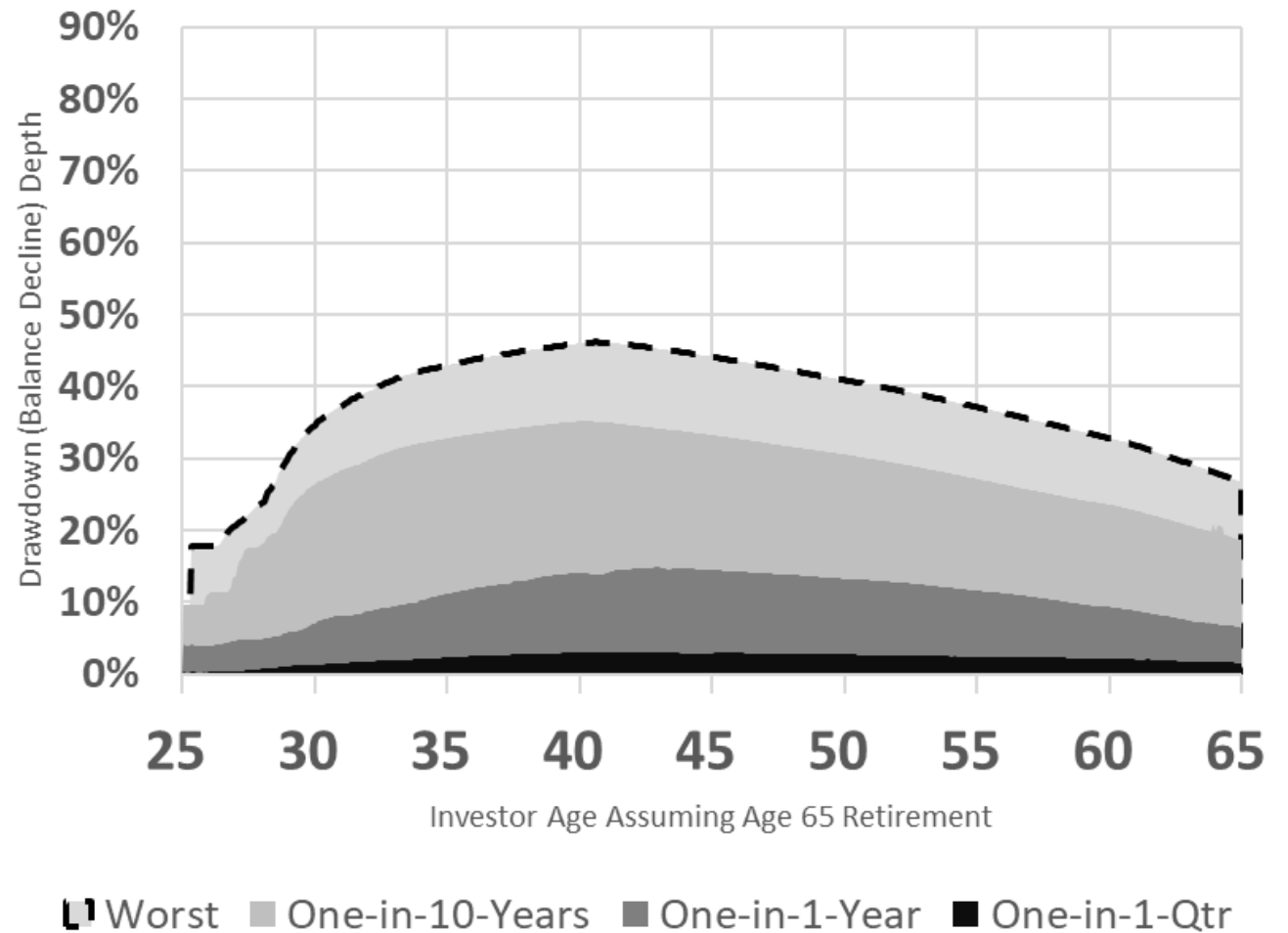
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Drawdown Depth vs. Age for Lump Sum Investment  
(based on 1970-2017 historical returns)

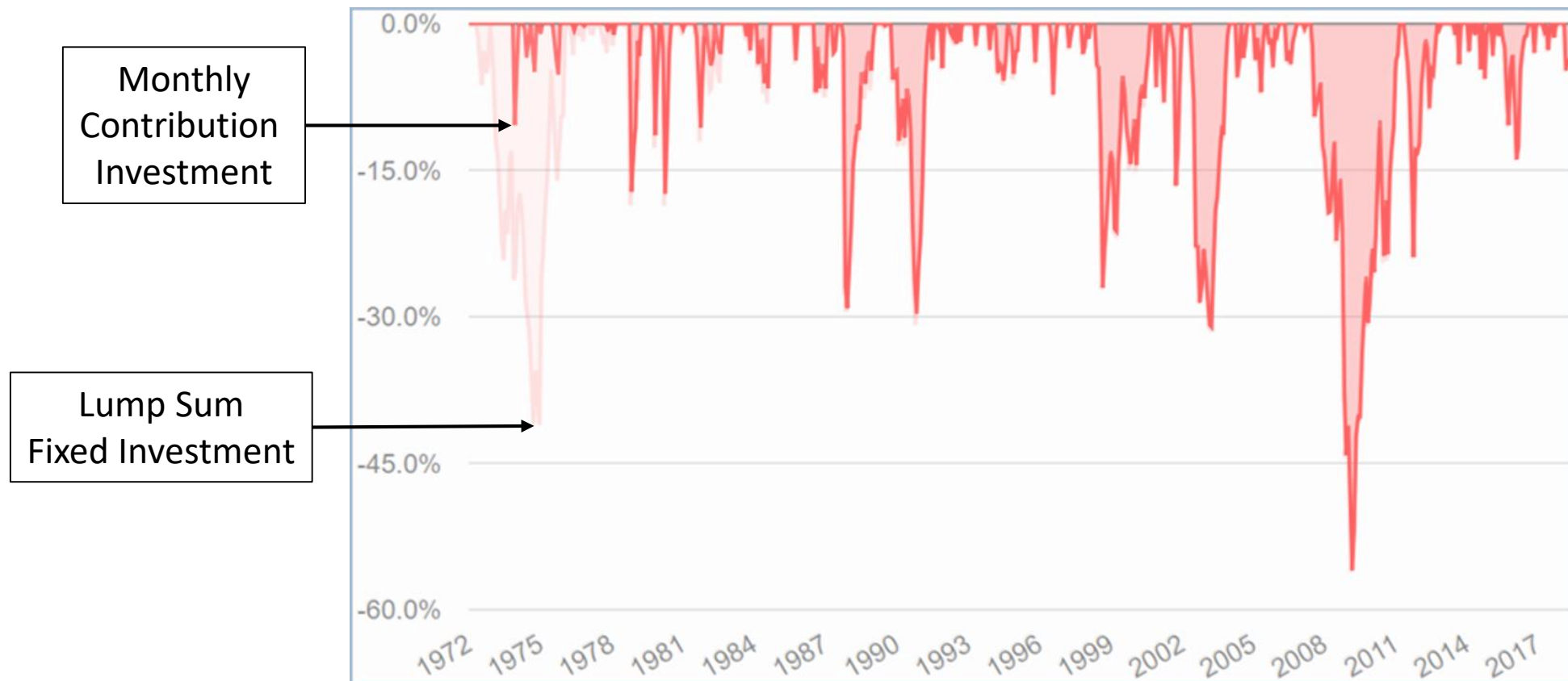


How well do  
they work for  
young  
portfolios?

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](http://www.portfoliovisualizer.com)

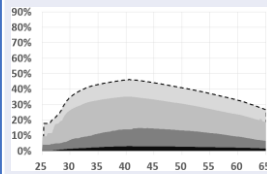
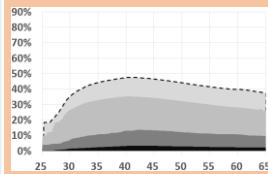
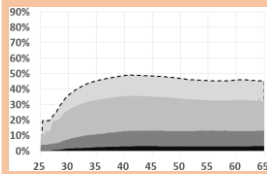
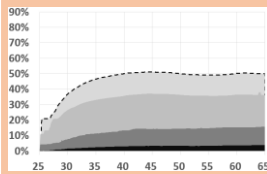


Putting bonds in  
a young portfolio  
is like ...

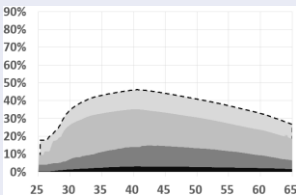
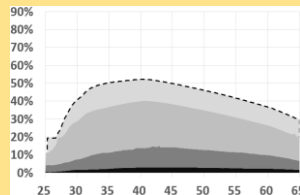
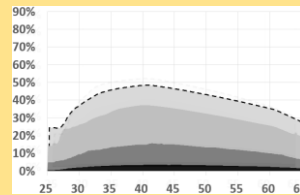
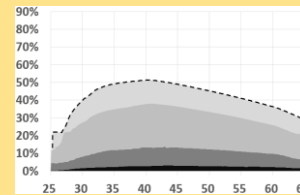
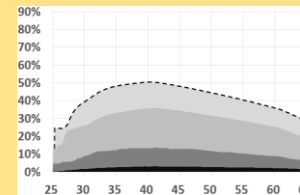
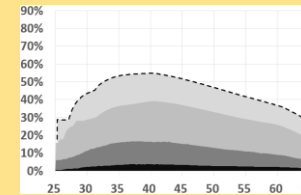


# How could we improve?

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

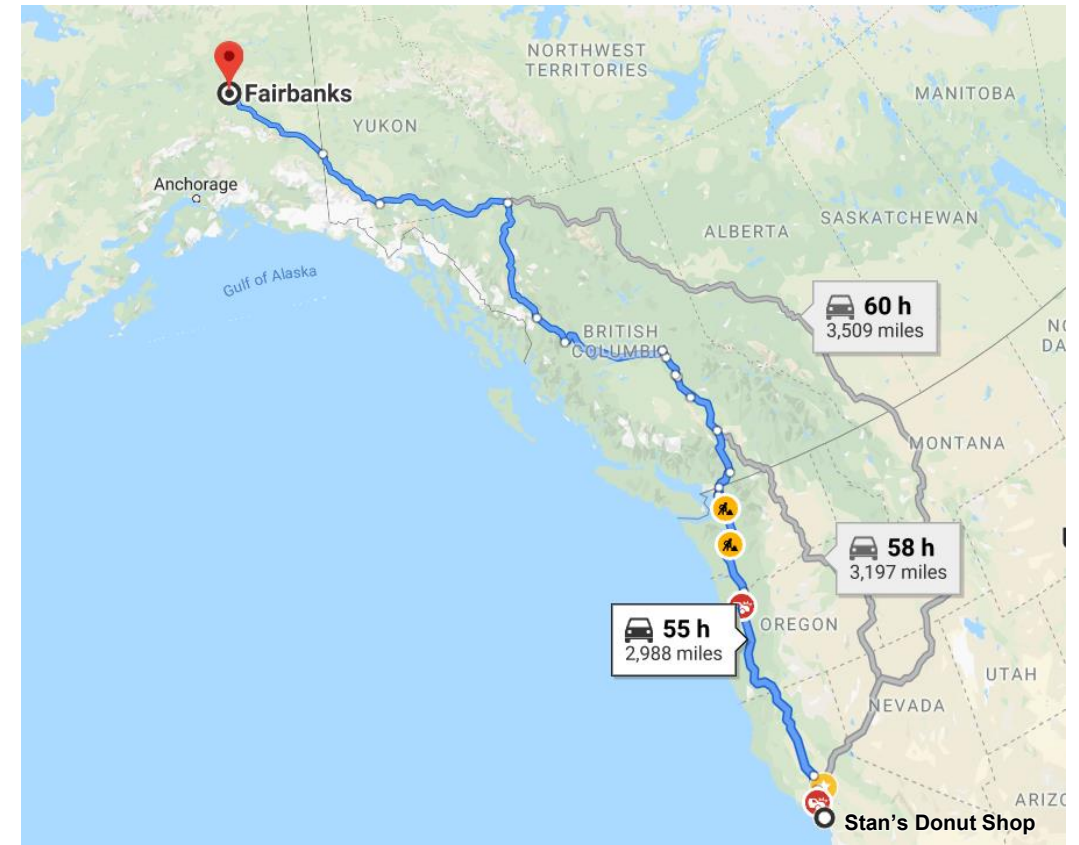
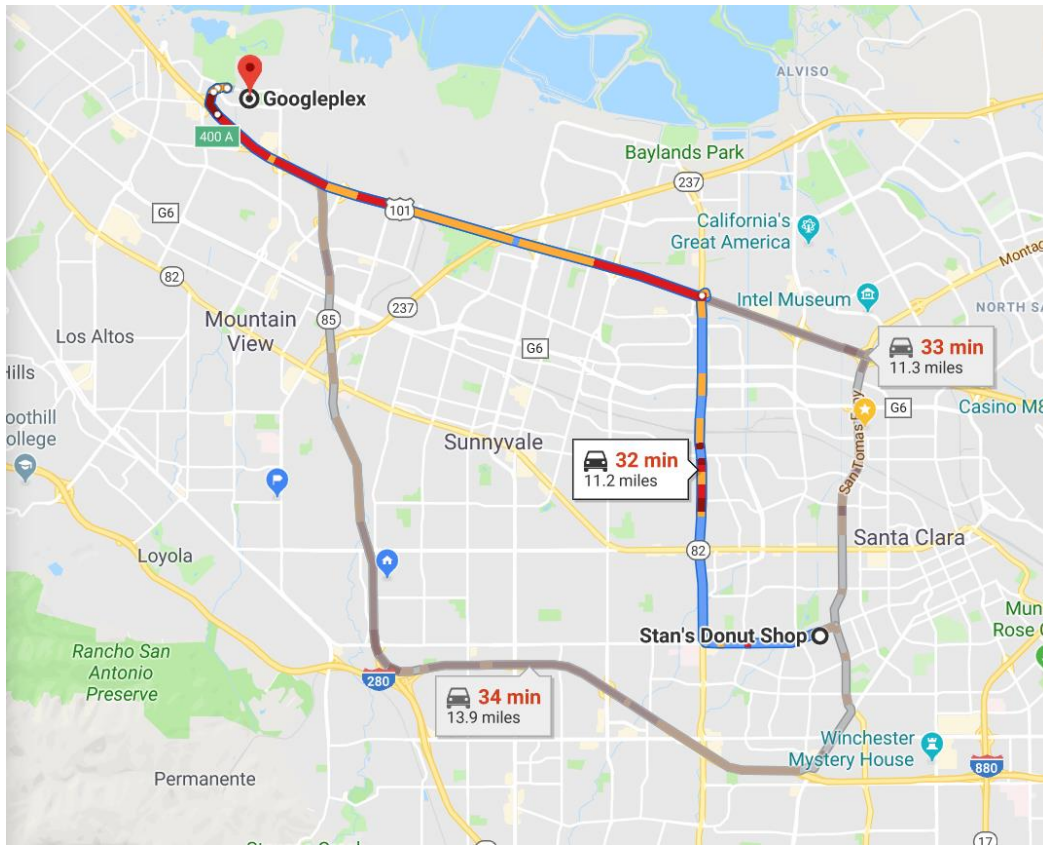
	Vanguard-like Target Date Fund (Baseline TDF)	90% TDF plus 10% US SCV	80% TDF plus 20% US SCV	70% TDF plus 30% US SCV
Rebalancing	Monthly	None – for second fund could be in different account		
End Balance Range (\$10k/yr + inflation for 40 years)	\$12.8 M <b>\$7.93 M</b> \$3.49 M	\$18.21 M <b>\$10.31 M</b> \$3.90 M	\$23.98 M <b>\$12.68 M</b> \$4.24 M	\$29.74 M <b>\$15.06 M</b> \$4.53 M
Inflation-Adjusted End Balances	\$2.36 M <b>\$1.61 M</b> \$0.72 M	\$3.19 M <b>\$2.09 M</b> \$1.02 M	\$4.20 M <b>\$2.56 M</b> \$1.22 M	\$5.21 M <b>\$3.03 M</b> \$1.30 M
Worst Drawdown	46%	48%	49%	51%
Age 65 Worst DD	26%	37%	45%	50%
Drawdown Risk versus Age				
<div> <span>■ One-in-90 Year</span> <span>■ One-in-10-Years</span> <span>■ One-in-1-Year</span> <span>■ One-in-1-Qtr</span> </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 ( $\$10\text{k}/\text{yr}$ + inflation for 40 years)	$\$12.8\text{ M}$ <b><math>\\$7.93\text{ M}</math></b> $\$3.49\text{ M}$	$\$16.24\text{ M}$ <b><math>\\$9.80\text{ M}</math></b> $\$4.26\text{ M}$	$\$15.38\text{ M}$ <b><math>\\$9.55\text{ M}</math></b> $\$4.01\text{ M}$	$\$17.50\text{ M}$ <b><math>\\$10.63\text{ M}</math></b> $\$4.56\text{ M}$	$\$18.79\text{ M}$ <b><math>\\$11.50\text{ M}</math></b> $\$4.79\text{ M}$	$\$22.83\text{ M}$ <b><math>\\$13.83\text{ M}</math></b> $\$5.64\text{ M}$
Inflation-Adjusted End Balances	$\$2.36\text{ M}$ <b><math>\\$1.61\text{ M}</math></b> $\$0.72\text{ M}$	$\$2.97\text{ M}$ <b><math>\\$1.99\text{ M}</math></b> $\$0.88\text{ M}$	$\$2.72\text{ M}$ <b><math>\\$1.94\text{ M}</math></b> $\$0.94\text{ M}$	$\$3.11\text{ M}$ <b><math>\\$2.16\text{ M}</math></b> $\$0.99\text{ M}$	$\$3.26\text{ M}$ <b><math>\\$2.33\text{ M}</math></b> $\$1.11\text{ M}$	$\$4.02\text{ M}$ <b><math>\\$2.80\text{ M}</math></b> $\$1.39\text{ M}$
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  $\sim 100\%$  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?!

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It depends



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



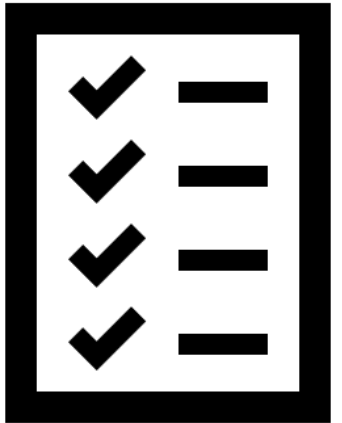
Raise or Lower Expenses  
& You Change  
Withdrawal Rate



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 2<sup>nd</sup> equity fund over time

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





Why ramp 2<sup>nd</sup> fund down, then up?



What can we expect?

“Test as you fly,  
fly as you test”

-- NASA



# Testing Retirement Scenarios with Portfolio Visualizer

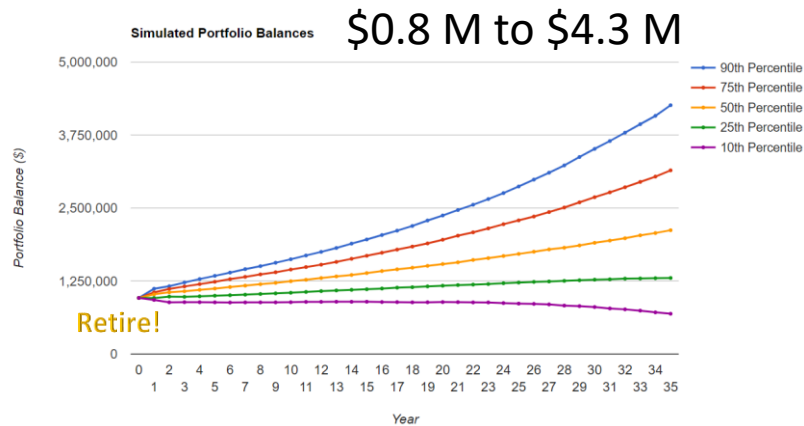
- It's free
- “Financial Goals” tool can model TDF allocations in retirement
  - Select Multistage Planning Type
  - Enter 7 Years to Retirement even though scenario is in retirement
  - Enter starting portfolio allocation to match TDF allocation at start
  - Enter ending portfolio allocation to match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

The screenshot shows the Portfolio Visualizer website. At the top, there's a navigation bar with links for Examples, FAQ, Contact, Tools, Register, and Login. The main header features the title "PORTFOLIO VISUALIZER" and a brief description of the tool's capabilities. Below this, there are six main tool categories, each with an icon and a list of sub-tools:

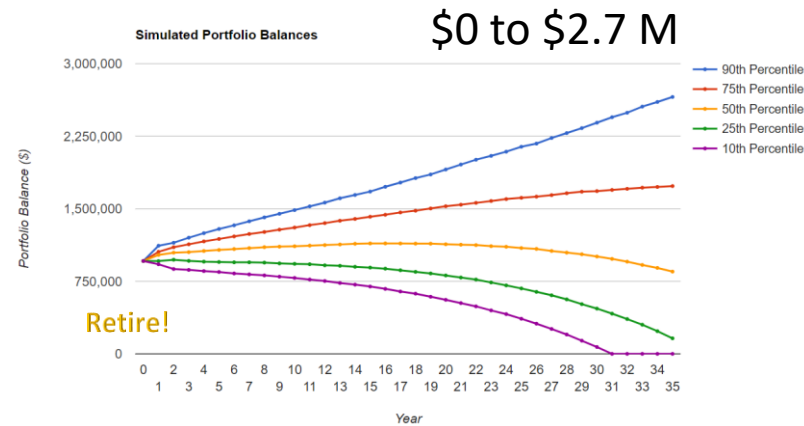
- Backtest Portfolio**: Backtest a portfolio asset allocation and compare historical and realized returns and risk characteristics against various lazy portfolios. Sub-tools: Backtest Asset Allocation », Backtest Portfolio », Backtest Dynamic Allocation ».
- Factor Analysis**: Run regression analysis using Fama-French and Carhart factor models for individual assets or a portfolio to analyze returns against market, size, value and momentum factors. Sub-tools: Factor Regression », Risk Factor Allocation », Match Factor Exposures », Principal Component Analysis », Factor Statistics », Fund Factor Regressions », Fund Performance Attribution ».
- Asset Analytics**: Find funds based on asset class, style and risk adjusted performance, and analyze asset correlations. Sub-tools: Fund Screener », Fund Performance », Asset Correlations », Asset Class Correlations », Asset Autocorrelation », Asset Cointegration ».
- Monte Carlo Simulation**: 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. Sub-tools: Monte Carlo Simulation », **Financial Goals »** (highlighted), Asset Liability Modeling ».
- Portfolio Optimization**: 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. Sub-tools: Historical Efficient Frontier », Forecasted Efficient Frontier », Portfolio Optimization », Black-Litterman Model », Rolling Optimization ».
- Timing Models**: Compare and test market timing models based on moving averages, momentum, the Shiller PE ratio valuation, and target volatility. Sub-tools: Market Valuation », Moving Averages », Momentum Rotation », Dual Momentum », Adaptive Allocation », Target Volatility », Core-Satellite ».

# 100% TDF w/ *fixed* withdrawals in retirement

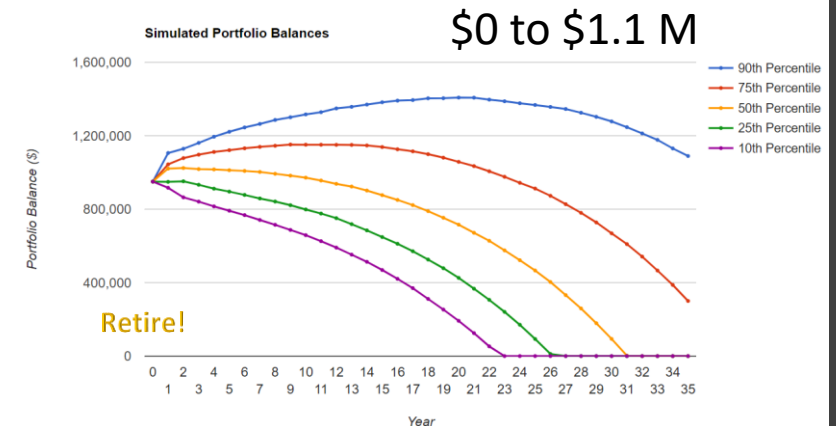
Portfolio Visualizer (4% fixed example at <https://bit.ly/2mr1Wqg>)



**3% Fixed  
Withdrawal Rate**



**4% Fixed  
Withdrawal Rate**



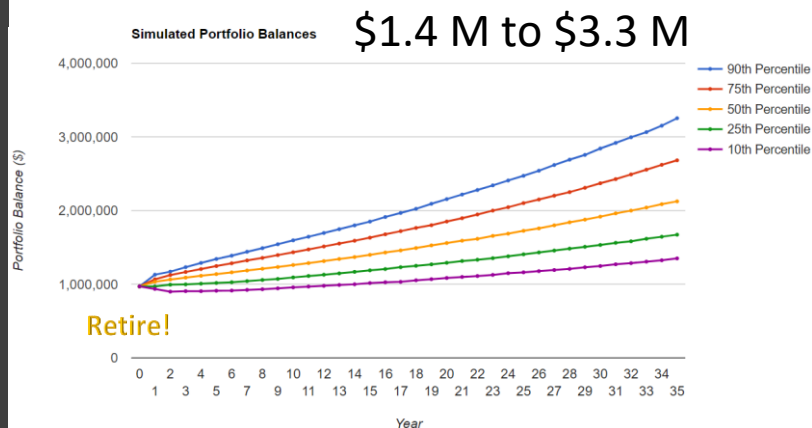
**5% Fixed  
Withdrawal Rate**

Only 34% make it all the way to 35 years

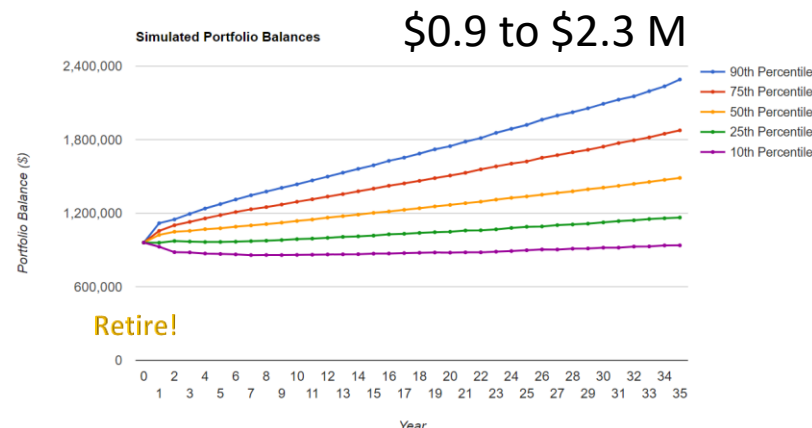
Assumes \$1M minus first withdrawal as starting balance at retirement, 35 years in retirement, and Vanguard-like TDF asset allocation glidepath. Fixed withdrawal dollar amount calculated as percent of balance at start of retirement and is then kept fixed except for increases to match inflation.

# 100% TDF w/ *variable* withdrawals in retirement

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

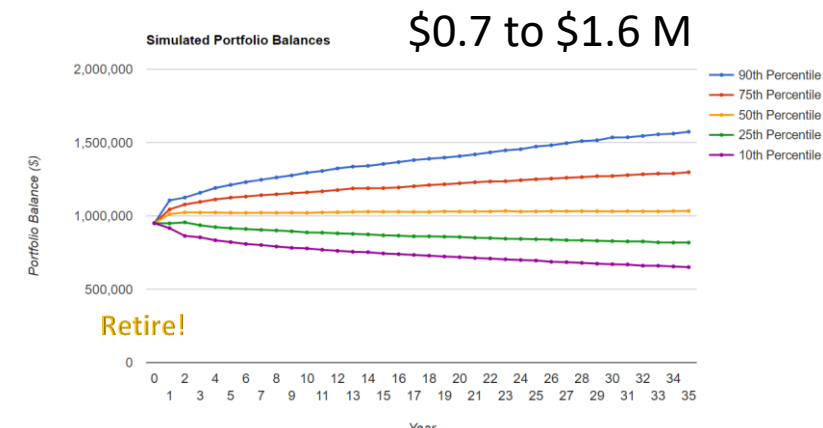


**3% Variable  
Withdrawal Rate**



**4% Variable  
Withdrawal Rate**

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



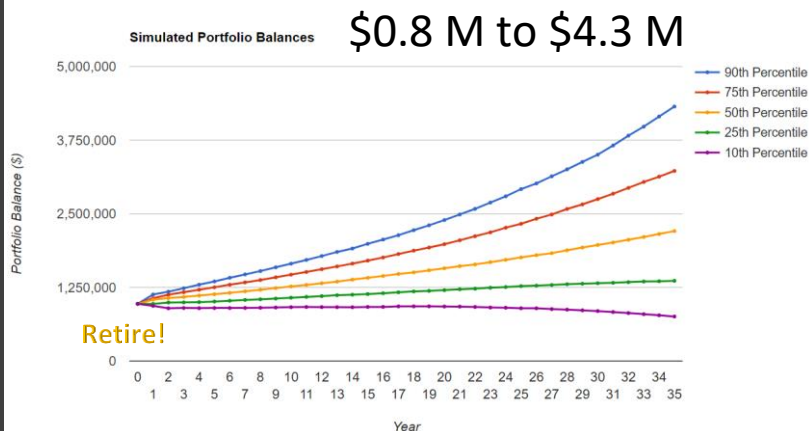
**5% Variable  
Withdrawal Rate**

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

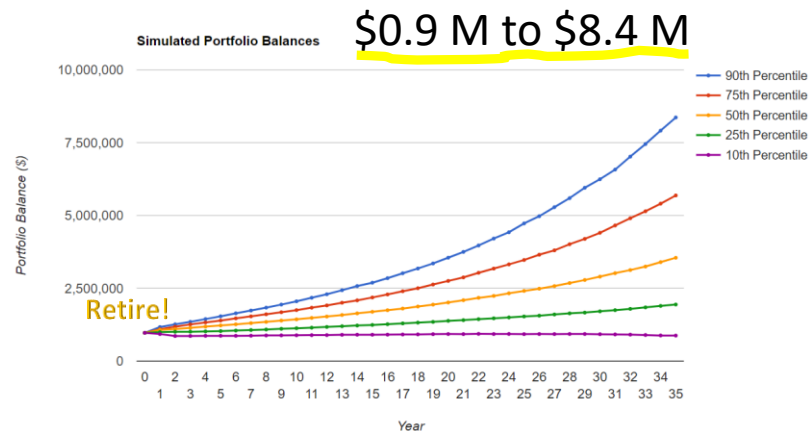
Assumes \$1M minus first withdrawal as starting balance at retirement, 35 years in retirement, and Vanguard-like TDF asset allocation glidepath. Variable withdrawal dollar amount calculated as percent of balance at start of each year in retirement, so dollar amount withdrawn varies year-to-year based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

# TDF + Value Fund Options for Over-Savers

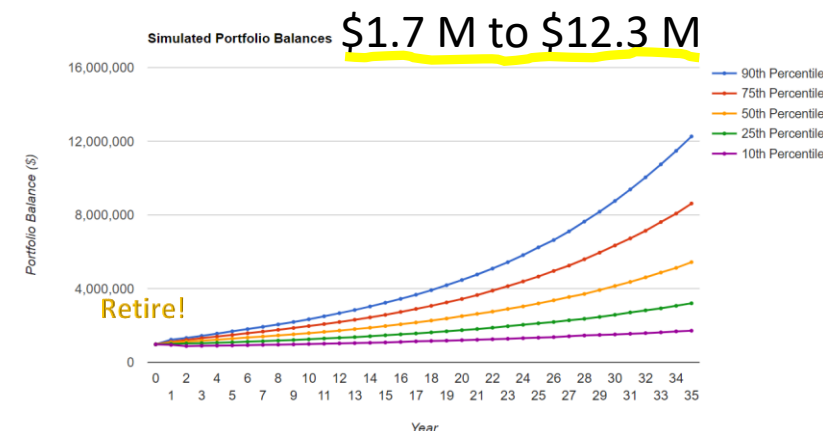
Portfolio Visualizer (75% TDF | 25% SCV example at <https://bit.ly/2mlcRBD>)



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



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



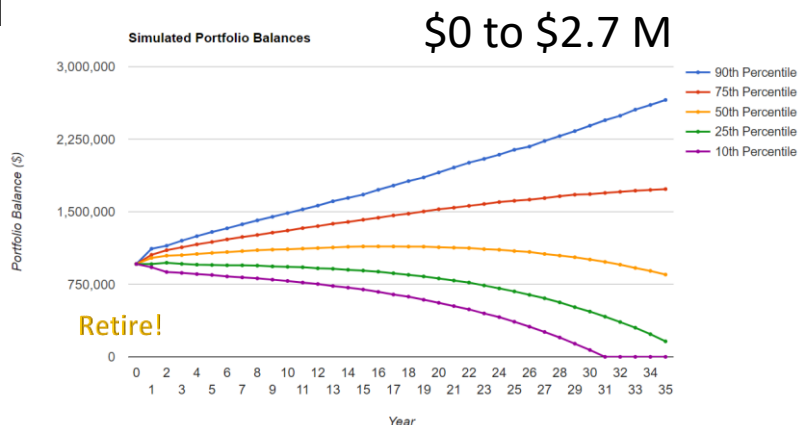
\$30k (3%) Fixed  
Withdrawal Rate  
75% TDF | 25% SCV

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.

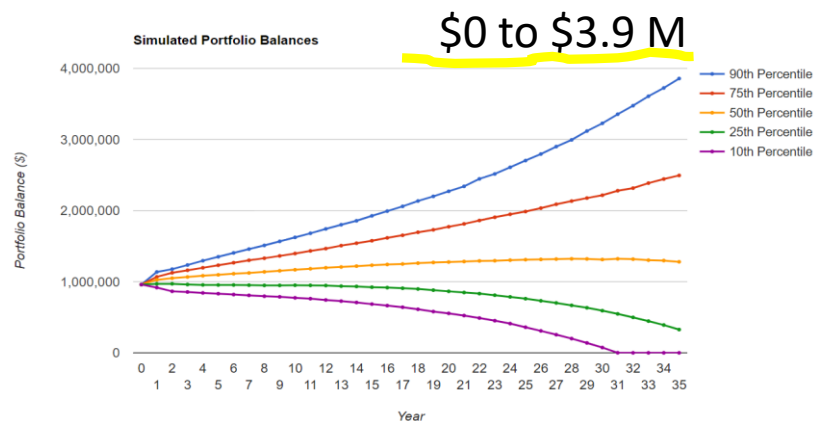


# TDF + Small-Cap-Value for “Just Enough” Savers

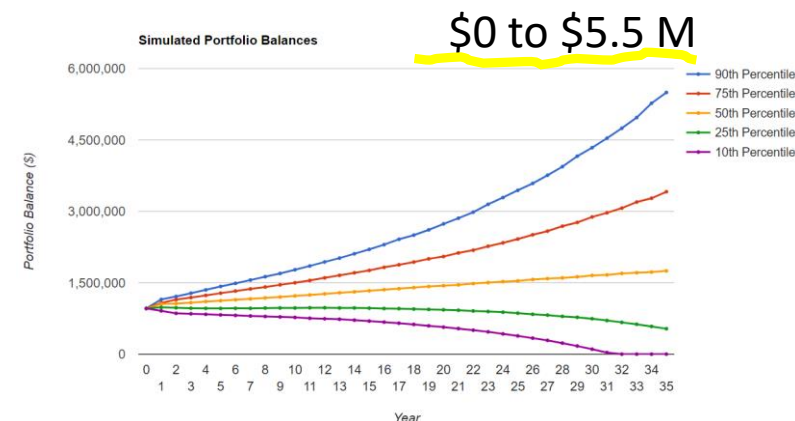
Portfolio Visualizer (4% fixed 80|20 example at <https://bit.ly/2m8eKBR>)



**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 <a href="http://www.paulmerriman.com">www.paulmerriman.com</a>
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](http://www.portfoliovisualizer.com)

[www.paulmerriman.com](http://www.paulmerriman.com)

[www.2fundsforlife.com](http://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 ...)