Target Date Funds . . . don’t make any sense

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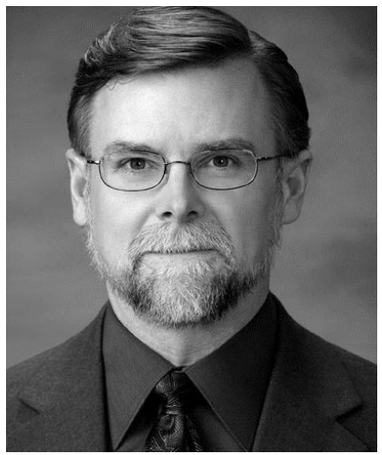

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What's a Target Date Fund

- Two common features
  - Maturity date, end date . . . . the so-called "Target Date"
  - Their allocation to stocks
    - Starts HIGH
    - Ends LOW

- Example
  - Maturity date 25 years in the future
  - Starts its life with 100% in stocks
  - Ends its life (25 years later) with 10% in stocks

Where are Target Date Funds used

- Defined Contribution pension plans
- 401k plans
- 529 college savings plans
- HSAs (Health Saving Accounts)
- Variable annuities

Why are Target Date Funds used

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- The answer to this question is essentially the topic of the article coming out in The Journal of Wealth Management . . . *"Target Date Funds, Mis-sold and Misused"*
- Were they built to solve a client's genuine investment needs . . . or were they built to address a marketing and sales need of the manufacturers?
- Are TDFs just a vacuous sales story . . . or a beneficial well-reasoned investment solution?
- The marketing story underlying TDFs is that
  - As the investor ages (passes through time), they benefit from the adoption of an ever more conservative asset mix, one that continually shifts from stocks to bonds
  - And that this journey is best and most easily achieved, by sticking with a single investment product, one that delivers this continuous dynamic risk-reduction as the investor ages

Background

Several problems to overcome . . . . in the analysis

- Use actual live returns instead of an assumed distribution or a Monte Carlo simulation . . . . Why?
  - Markets trend, have momentum, experience episodic eras
- Use a long long period of history
  - To fully neutralize Sequence of Return Risk
  - Article uses 1885 to the present
- Stop cherry picking your market
  - If you use U.S. returns . . . then you are ex-post cherry picking the single best country
  - This is grossly unrealistic

Return statistics for U.S., international, and global asset classes

			Stocks			Bonds			60/40 stocks/bonds			Precious metals
			U.S.	International	Global	U.S.	International	Global	U.S.	International	Global	
Geometric mean return (%)			6.67	4.93	6.13	1.60	1.68	1.73	4.97	3.80	4.54	0.79
Annualized standard deviation (%)			17.23	14.39	13.55	4.08	8.73	5.51	10.78	10.80	9.23	12.21
Return per unit of risk			0.39	0.34	0.45	0.39	0.19	0.31	0.46	0.35	0.49	0.06
Autocorrelation (current month to prior month)			0.09	0.10	0.11	0.25	0.11	0.19	0.10	0.11	0.11	0.05
Longest	Time period when total return was negative	Number years lasted	15.4	18.9	10.0	45.3	50.8	49.8	11.9	18.8	10.4	74.5
		End of period	1/31/1945	6/30/1933	3/31/1983	2/28/1986	3/31/1987	3/31/1986	11/30/1984	4/30/1933	5/31/1926	4/30/1973
Second longest		Number years lasted	12.0	10.1	9.3	18.8	24.3	22.3	8.6	13.1	10.1	31.2
		End of period	12/31/1984	11/30/1954	12/31/1925	10/31/1927	3/31/1933	4/30/1931	7/31/1924	1/31/1959	3/31/1983	3/31/2011
Correlation with precious metals			0.07	0.23	0.16	0.12	0.24	0.24	0.08	0.26	0.20	1.00

Statistics based on the time period spanning 1/31/1885 through 9/30/2022

All statistics are based on inflation-adjusted monthly total returns

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U.S. economy grows more slowly with the passage of time, as it matures and its flexibility and demographics decline

Annualized growth rate (in %) of	Fifteen years ending on March 31st of									
	1888	1903	1918	1933	1948	1963	1978	1993	2008	2023
Real GDP	5.13	4.61	3.14	0.53	6.27	3.75	3.78	2.99	3.15	1.49
Population	2.32	1.95	1.76	1.29	0.98	1.92	1.00	0.97	1.05	0.70
Real GDP per capita	2.75	2.61	1.36	-0.75	5.24	1.80	2.75	2.00	2.08	0.78

Fifteen years ending 3/31/1918 included three recessions (in their entirety) and part of an additional recessions (but only partially)

Fifteen years ending 3/31/1933 included the 1920/1921 Depression and most but not all of The Great Depression which started in 1929

Estimates for 2022 and 2023 provided by Financial Forecast Center, LLC at www.forecasts.org

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70 years (35 years of accumulation and 35 years of distribution) - Seven simple cases

Precious metals allocation (%)	Portion not allocated to precious metals		Statistics about resulting monthly withdrawals							Rules governing withdrawal phase	
	Stock allocation at very beginning (%)	Stock allocation after 70 years have passed (%)	Median ($)	1.5th percentile ($)	Metric of success	Average ($)	Standard deviation ($)	0.5th percentile ($)	2.5th percentile ($)	Minimum monthly withdrawal ($)	Initial divisor
0	100	100	9,282	3,767	4.37	13,244	10,514	3,767	3,767	3,767	401
0	100	0	4,024	2,350	1.18	6,051	4,949	2,350	2,350	2,350	486
10	100	0	3,611	2,114	0.95	5,390	4,320	2,114	2,114	2,114	484
0	100	25	5,148	2,724	1.75	7,444	6,005	2,724	2,724	2,724	462
7.5	100	40	5,365	2,665	1.79	7,462	5,668	2,665	2,665	2,665	437
0	90	10	4,044	2,344	1.18	5,991	4,824	2,344	2,344	2,344	480
0	75	25	4,115	2,300	1.18	5,860	4,449	2,300	2,300	2,300	457

Assumes monthly contributions of $1,000 for 35 years

Based on no upfront initial investment

Withdrawal rules set such that failure was avoided during all 1,651 unique historical investment periods

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20 years (20 years of accumulation followed by full and immediate distribution) - Seven simple cases

Precious metals allocation (%)	Portion not allocated to precious metals		Statistics about resulting single end of period distribution						
	Stock allocation at very beginning (%)	Stock allocation after 20 years have passed (%)	Median ($)	1.5th percentile ($)	Metric of success	Average ($)	Standard deviation ($)	0.5th percentile ($)	2.5th percentile ($)
0	100	100	489,164	216,202	3.53	527,857	184,074	179,860	241,451
0	100	0	351,067	172,120	2.01	384,971	132,154	143,556	198,695
10	100	0	344,571	171,836	1.97	371,380	113,627	144,781	197,371
0	100	25	383,851	182,994	2.34	417,020	137,562	152,918	216,126
7.5	100	40	393,539	189,172	2.48	421,346	123,998	158,651	221,723
0	90	10	359,311	173,020	2.07	390,171	131,448	144,851	202,687
0	75	25	370,147	175,764	2.17	398,039	130,981	146,723	207,198

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5 years (5 years of accumulation followed by full and immediate distribution) - Seven simple cases

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	Stock allocation at very beginning (%)	Stock allocation after 5 years have passed (%)	Median ($)	1.5th percentile ($)	Metric of success	Average ($)	Standard deviation ($)	0.5th percentile ($)	2.5th percentile ($)
4.7	100	55	74,365	52,132	0.1292	75,749	11,931	42,880	55,402
5	100	0	72,084	52,078	0.1251	72,287	9,394	42,763	53,561
0	100	25	73,226	51,938	0.1268	74,189	10,777	42,570	54,732
7.5	100	40	73,392	52,145	0.1276	74,549	10,658	42,955	55,262
0	90	10	72,472	51,996	0.1256	72,851	10,028	42,320	53,660
0	75	25	72,544	51,788	0.1252	73,287	10,397	42,165	53,727
5	100	100	76,838	47,370	0.1213	78,719	15,503	42,069	50,268

Assumes monthly contributions of $1,000 for 5 years

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So why do stocks dominate?

- Why do stocks dominate?
- Why are bonds and/or precious metals so harmful?

- Why is this the case for periods as short as just 10 years?

Consider how much greater the returns are to stocks

- Stocks versus bonds and/or precious metals
- 6.13% stocks
- 1.73% bonds
- 0.79% precious metals

- Or proportionately . . . . the right way to look at it
  - Stocks return 255% more than bonds
  - Stocks return 674% more than precious metals

Consider how frequently stocks outperform bonds and/or precious metals

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Investment time period	Probability stocks will earn more than . . .	
	Bonds	Precious metals
5 years	78.3 %	76.1 %
10 years	89.6	82.1
15 years	95.6	82.4
20 years	99.5	90.2
25 years	100	95.3
30 years	100	100

Based on the time period from 1885 through the present

But far far more important . . . on why 100% stocks wins

- Time diversification . . . . or “dollar cost averaging”

- This is the very essence of the types of accounts (401ks, etc) that use TDFs
  - For accumulation . . . monthly contributions
  - For retirement . . . . monthly withdrawals

- Extreme case . . . 70 years
  - 35 years of monthly contributions . . . . during your employment years
  - 35 years of monthly withdrawals . . . during your retirement years

- Modest case . . . 20 years
  - 529 college savings plan
  - “20 years” of monthly contributions
  - Followed by full liquidation over the subsequent 4 years

But far far more important . . . on why 100% stocks wins

- The problem with stocks is
  - Their volatility
  - Sometimes they are underpriced . . . and sometimes overpriced

- But none of this matters . . . . not a single wit

- Why?

- Because you've just spread your contributions and/or withdrawals into seriously tiny bites spread over 840 months (the 70 yr case) or 240 months (the 20 yr case)

Since 1885, all-stock portfolios have dominated bond and balanced portfolios when given just 7.5 years

Percentile (%)	Annualized geometric mean return (%)					
	7.5 year long rolling time windows			2.5 year long rolling time windows		
	Stocks	Bonds	60/40 stocks/bonds	Stocks	Bonds	60/40 stocks/bonds
99.5	19.7	11.3	14.8	37.2	22.4	29.5
99	18.9	11.1	14.2	34.3	20.4	27.7
95	15.0	9.4	11.5	24.0	12.3	15.7
90	13.5	7.7	9.9	18.8	7.8	12.5
75	9.2	5.1	6.9	12.3	5.2	8.1
50	5.7	1.2	4.2	6.5	1.9	4.2
25	3.1	-0.7	1.8	1.0	-0.8	0.3
15	1.9	-2.0	0.4	-2.5	-3.1	-2.0
10	0.7	-3.5	-1.0	-5.2	-5.5	-3.5
5	-1.0	-5.4	-2.3	-11.2	-9.7	-7.6
1	-6.2	-9.2	-7.6	-18.7	-12.7	-12.5
0.5	-6.7	-10.0	-8.2	-21.8	-16.5	-15.6

Green (red) shaded areas show the best (worst) returning portfolio for the designated percentile level

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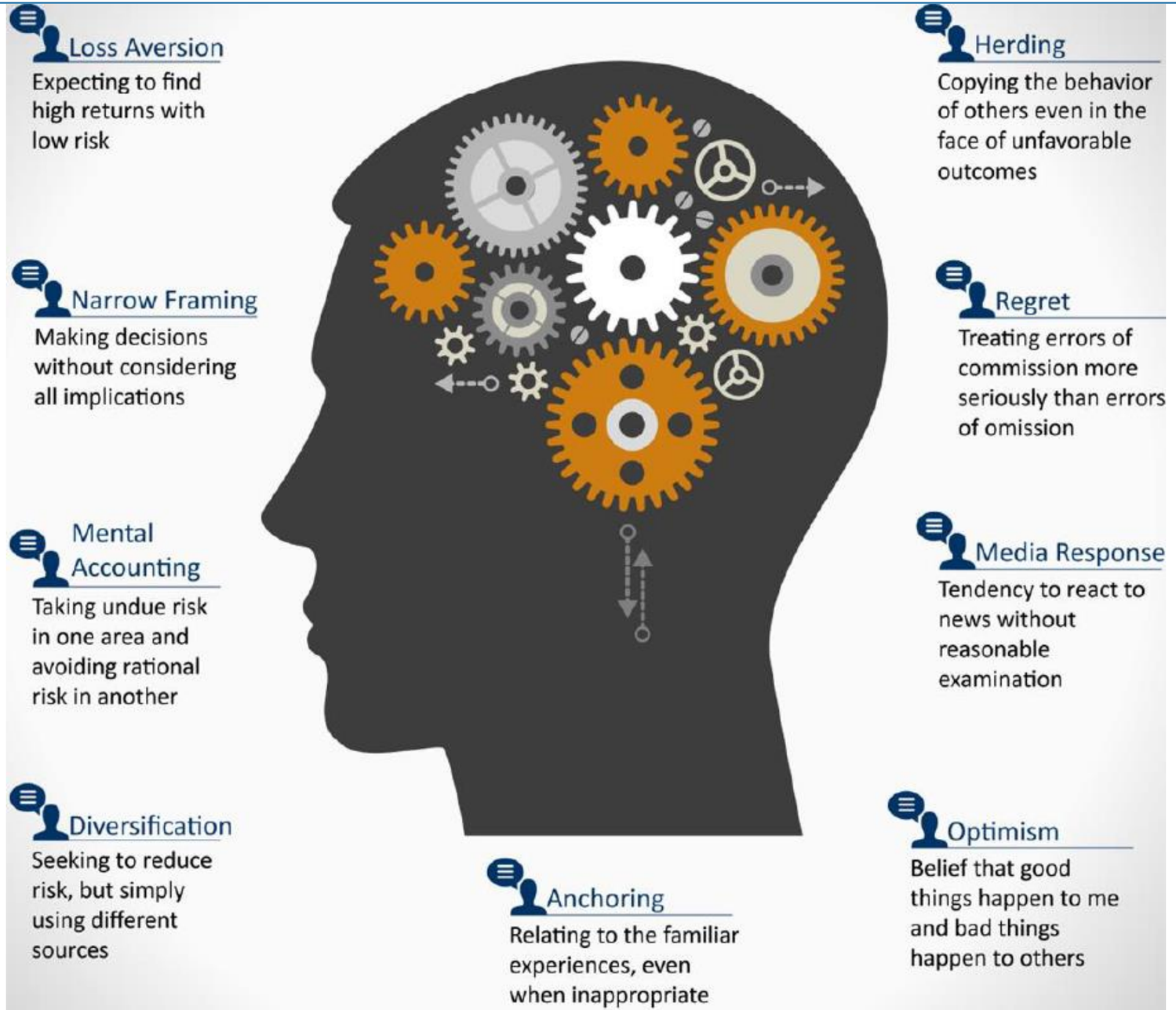
Are there any qualifications

To the results presented in this journal article

Qualifications

- If you can market time
- If active management of the stock/bond mix dependably adds value inside the structure of a TDF
- If the gap between stock and bond returns shrinks
- If behavioral bias can be successfully mitigated through the use of Target Date Funds

The insidious behavioral biases



The insidious behavioral biases

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Loss aversion

Irrational risk avoidance

Diversification

Not understanding the source of risk reduction

Media response

Listening to the news

Narrow framing

Restricting your information

Anchoring

Tying yourself to an initial perspective

Regret

Would of, could of, should of

Mental accounting

Treating different sources differently

Optimism

Overconfidence and lack of humility

Herding

Following the crowd

Why are Target Date Funds used

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- The answer to this question is essentially the topic of the article coming out in The Journal of Wealth Management . . . *"Target Date Funds, Mis-sold and Misused"*
- Were they built to solve a client's genuine investment needs . . . or were they built to address a marketing and sales need of the manufacturers?
- Are TDFs just a vacuous sales story . . . or a beneficial well-reasoned investment solution?

  But are useful for short investment periods such as 5 years . . . and for mitigation of behavioral bias
- The marketing story underlying TDFs is that
  - As the investor ages (passes through time), they benefit from the adoption of an ever more conservative asset mix, one that continually shifts from stocks to bonds
  - And that this journey is best and most easily achieved, by sticking with a single investment product, one that delivers this continuous dynamic risk-reduction as the investor ages

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Is it alpha, beta, an expensive false story, or a useful behavior management tool?

Friday

November 18th

11:00 a.m. EASTERN

Important Disclosures

All data and statistics were provided by Global Financial Data, Inc. and NDR, Inc. (unless otherwise indicated in the exhibit)

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