

TARGET DATE FUNDS

Characteristics and Performance

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What We Know:

- There is a vast literature that shows that participants in 401(k) plans make suboptimal decisions.
- Participants change their asset allocation depending on choices offered.
- Participants infrequently revise their allocations.
- Participants chase past return.
- Participants are influenced by default choice they are offered.
- Participants don't invest enough.

Use of Target Date Funds in 401(k) Plans - 2013

- 72% offer Target Date Funds
- 41% 401(k) investors hold Target Date Funds
- 20% 401(k) assets in Target Date Funds
- 43% assets of new employees in Target Date Funds

- Growth
2008 – 2012 160B to 481B

Theory

- Constant Proportions – Merton Samuelson
- Decreasing: Bodie Merton Samuelson
Campbell and Viceira
Cocco Gomes Maenhout
- Increasing: Shiller

Empirical

1. Poterba Rauh Venti Wise

Our Study

- Characteristics
- Performance

Vanguard Planned Glide Path

	Current	5 years	10 years	15 years	20 years	At maturity
Total stock market index	60	55	50	44	38	29
Total international stock index	26	24	21	19	16	13
Total bond market index	14	22	29	37	40	42
Inflation-protected securities	0	0	0	0	6	14
Prime money market	0	0	0	0	0	2

Sample

1. Restricted to 2035 or 2030 target date

Why:

- a) Different target dates are different mixtures of same funds
 - b) Since the same managers manage all dates, deviations from the glide path are similar across different target dates
2. Fifty families offering target date funds
 3. 229 different share classes
 4. Monthly data on all of their holdings

2035 Debt Equity Choices

Equity percent

Debt percent

Below 70	9.7%		Below 8	9.7%
70–75	25.8%		8–11	22.6%
75–80	22.6%		11–14	16.1%
80–85	25.8%		14–17	22.6%
85–90	16.1%		17–20	16.1%
			Above 20	13%

Holdings

- Number
 - Average 17 funds
 - 68% 10 or more funds
 - 24% 25 or more funds
- Which Family
 - 63% all from same family
 - Outside almost always passive and not offered by family
 - 13.7% outside active

TDF holdings of five types of specialized underlying funds (in percent)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	Add with delay
Emerging market equity	0	0.0%	0.0%	33.3%	45.8%	62.5%	52.5%	62.8%	75.6%	44.1%
Emerging market debt	0	0.0%	0.0%	0.0%	4.2%	15.6%	17.5%	16.3%	22.2%	70.0%
Domestic real estate	0	20.0%	14.3%	33.3%	25.0%	40.6%	35.0%	39.5%	53.3%	58.3%
International real estate	0	0.0%	14.3%	6.7%	29.2%	37.5%	32.5%	34.9%	35.6%	81.3%
Commodities	0	0.0%	0.0%	6.7%	12.5%	18.8%	30.0%	39.5%	40.0%	55.6%

Other categories

- 19% sector bets
- 8% county bets
- 4% long short funds

Expense ratios across target share classes

Share class	Average total expenses	Average target fund expenses	Average fund underlying expenses
A	1.135	0.527	0.609
C	1.822	1.202	0.62
Investor	0.731	0.249	0.483
No load	0.81	0.132	0.678
Average retirement	1.028	0.417	0.612
Maximum retirement	1.244	0.63	0.616

Asset classes of shares held

- 56% institutional
- 6.5% retirement
- 15.93% master trusts

Fees on Do-It-Yourself

	Total fees	Underlying fees	Investor matching portfolio fees
A shares (22 funds)	1.117	0.587	1.021
No-load shares	0.767	0.71	0.725

Measuring Fund Selection Ability

- Normally run a time series equation of the form:

$$R_{i,t} - R_{F,t} = \alpha_i + \sum \beta_{i,l} R_{l,t} + e_{i,t}$$

where

1. $R_{i,t}$ is the return of fund i in period t
2. $R_{F,t}$ is the riskless rate in period t
3. $R_{l,t}$ is the return of index l in period t measured in excess return form
4. $\beta_{i,l}$ is the sensitivity of fund i to index l
5. α_i is the average return of fund i unexplained by the index
6. $e_{i,t}$ is the residual in period t for fund i

Two Problems

1. TDFs designed to decrease risk over time. Betas will change over time. Betas and alphas will be misspecified if a time series regression is fit.
2. We need to select the indexes.

Changing Beta

- We employ the bottom up approach of Elton, Gruber and Blake to solve the problem of changing betas.
- Compute betas and alphas each month for each of the holding of a TDF and multiply by the fraction of the TDF portfolio in that asset and sum over all assets.
- This is then averaged over time for each TDF and averaged across TDFs.

Identifying the Indexes

- One set of indexes for each Morningstar classification
- Fund of funds held funds in 12 classifications. For example, for domestic stock funds we used Fama French Carhart indexes.
- For domestic bond funds we used a general bond index, a mortgage index and a high yield index.

Do TDFs show selection ability?

- Before TDF expenses $\alpha = -20$ BP Expense 60 BP
- For investors in general $\alpha = -70$ BP Expense 110 BP
- The difference in alpha = the difference in expenses
- Funds of funds select no better than investors in general. They look better not because of better selection but because of selecting share classes with lower expenses.

How do they do for their investors? (including TDF expenses)

- -20 bp plus -53 bp at the TDF level = -73 bp
- About the same or slightly worse than investors in mutual funds

We examined some simple strategies

1. Hold starting weights constant over life of the fund of funds. Invest only in the funds held in 5 major categories: domestic and international stocks, and domestic and international bonds.

Obtain higher Sharpe ratios 67% of the time, the difference is statistically significant at 5% level.

2. Same procedure with index funds results stronger.

The investor world is better off using a buy and hold strategy in the five major investment types. Even better off using index funds.

Shareholder Objectives and Family Objectives

- Why don't TDFs do better? The bulk of their holdings are in funds offered by the same family as the TDF.
- They should benefit from having non-public information.
- Offsetting factor is conflict of interest – agency problem

- 69.9% of TDFs (720 cases) added a fund with at least one alternative in the same Morningstar classification in the same fund family.
- The average number of alternative was 3.9.
- Where may conflict arise
 - New funds
 - Small funds
 - High management fees
 - Funds with high outflows

New Funds

- In 15% of cases could have selected a fund that existed less than three months.
- Selected it 72% of the time if random 34% of the time. Annual alphas over next three years 86 bp lower than alternative ($t = 2.14$).
- Less than 1 year selected 57% of the time while if random 34% of the time.

Tendency to add new funds and their subsequent performance was lower than alternatives.

Selection of small funds (only after 6 months in existence)

Size	α	t
Under 60m	-2.40	2.09
100m	-2.09	2.73
150m	-1.44	2.04
200m	-1.16	2.07

Management Fee

- No evidence that selected funds with high management fee on average
- 13 cases management fee 40bp higher
 $\alpha = -.256$ $t = 2.4$
- 33 cases management fee 30bp higher
 $\alpha = -1.15$ $t = 1.4$
- Funds with cash outflow – not significant

Conclusions

1. Investors pay only a small amount in expenses above what they would pay to replicate TDFs.
2. TDFs show very little skill in selecting funds they hold but they select low expense classes of funds.
3. TDFs hurt performance by
 - a) Not following their glide paths
 - b) Including esoteric investments
4. Some TDFs pursue fund family objectives to the detriment of investors' objectives.
5. TDFs would do a lot better if they held index funds.