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Life Cycle funds: lack of disclosure and lack of return

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Abstract

Life Cycle funds have been a Qualified Default Investment Option for automatic enrollment for 401(k) retirement plans since 2006. Close examination of these funds and existing benchmarks reveals little transparency or uniformity in allocation, methodology, and timing. Already $340 billion, and growing, these funds' characteristics can have a significant impact on individuals' long-term investment decisions. While many studies of Life Cycle investing use simulation, our contribution is to construct simple benchmarks for empirical analysis of Life Cycle fund performance. Our analysis shows that the funds largely underperform dynamic and static benchmarks across target dates on an absolute and risk-adjusted basis.

JEL classification: G23; G11

Keywords: Mutual funds; Fund performance; Target-date funds; Life Cycle funds; Retirement investments

1. Introduction

Investment has flowed steadily into Life Cycle funds, with net cash inflows of $56 billion in 2007; $41 billion in 2008; $43 billion in 2009; and $44 billion in 2010. Life Cycle fund (also called Target Date fund) investments overall increased 33%, to almost $340 billion, from 2009 to 2010. Of this, $245 billion was invested through defined contribution plans and $65 billion through IRAs. Further, one third of participants in 401(k) plans had some investment in Life Cycle funds as of the end of 2009. Already a popular option in retirement accounts because of their perceived simplicity, Life Cycle funds were designated as one of only three Qualified Default Investment Options for 401(k) plans by the U.S. Government in

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1057-0810/11/$ – see front matter

2006. This designation is likely to further increase the number of plans offering Life Cycle funds from the 77% who did in 2009.[1]

Unfortunately, these funds have disclosure problems with respect to allocation, methodology, and timing.[2] This absence of transparency is even more of a concern since 401(k) participants in their 20s held 23.5% of their asset allocation in target date funds, compared with 7.6% of their asset allocation for participants in their 60s.[3] Investors in the Life Cycle option of 401(k) plans not only tend to be younger, but also to have smaller balances, and in general have less knowledge about the financial markets when compared with 401(k) investors overall, as documented by Mitchell, Mottola, Utkus, and Yamaguchi (2009). Given the relative youth and inexperience of the investor base, our analysis and results have long-term implications for a large number of individual investors. The purpose of this paper is to provide a basis for understanding the asset allocations, fee structure, and risk-adjusted performance of these funds.

Another contribution of this paper is to examine some of the benchmarks for Life Cycle funds and assess whether or not the funds have provided investors risk-adjusted return over their history. While many authors have studied simulations of asset allocations over investor life cycles (e.g., Ervin et al., 2009; Kyrychenko, 2008; Meyaard and Templeton, 2002; Pfau, 2010; Schleef and Eisinger, 2007), few have analyzed the indices currently used to benchmark Life Cycle funds. We parse these indices, and construct dynamic and static indices to analyze the performance of Life Cycle funds and common benchmarks.

Life Cycle funds (also commonly called Target Date funds) are a subcategory of all-in-one mutual funds that provide diversification and active asset allocation over time. Life Cycle funds are intended to become more conservative systematically as the investor's target retirement date approaches. Life Cycle funds set target retirement dates such as 2010, 2015, 2020, ..., 2045, 2050, 2055. When a fund is first established, with a long term until the target retirement date, the fund manager invests heavily in equities. With the passage of time, the fund manager gradually shifts the investment mix towards more conservative debt securities. The rate at which the fund manager shifts this allocation varies considerably across fund companies. The shift in allocation might be based on an asset allocation model, or on a common allocation heuristic such as equity percentage equal to 100 or 120 minus the investor's assumed age, with the remainder in debt securities. After the target date, the fund remains open, retaining the ending asset allocation.

One criticism of Life Cycle funds is that this mixture is not fully disclosed and at times leaves the fund manager plenty of leeway in what types of securities are allowed. For example, Morningstar reported as of May 2010, near-term 2010 Target Date Funds target equity allocation varies from a high of 67% for American Funds Target Date Retirement 2010 A (with returns of −27% and 23% in 2008 and 2009, respectively) to a low of 26% for Well Fargo Advantage DJ Target 2010 A (with returns of −11% and 12% in 2008 and 2009, respectively).[4] Because the asset allocation impacts the underlying risk of the fund, it also affects its expected return on both a total and risk-adjusted basis. Although the range of allocations was not as great for the long-term 2050 Target Date Funds (99% to 84%), there is still considerable variation in the fund holdings within the debt and equity subclasses. Further, if the language in the prospectus is vague, fund managers can change their

allocations over time beyond the stated heuristic, usually without an easily understood disclosure to investors.

Another difference among Life Cycle funds is the degree of active management within the funds over time. For example, the TIAA-CREF Lifecycle Series is categorized as 100% active (0% passive) at the one extreme, while the ING Index Solution Series is described as 0% active (100% passive) at the other extreme.[5] Further variation among Life Cycle funds arises from the allocation among asset subclasses. For instance, "equity" may be allocated among domestic, foreign, and emerging markets. "Fixed income" could include domestic and foreign; corporate and government; and high yield and investment grade. Many funds also invest in niche assets such as commodities and real estate securities. Some funds use inflation-protected securities, while others do not. Even cash or near-cash allocations may include money market instruments of varying structure and quality.

Fee disclosure is another potential problem. The fees from the subclasses of investments flow through to the investor, along with management fees for the allocation fund itself. Given that most Life Cycle funds utilize funds within their own fund family for the equity and debt exposures, investors may be impacted by additional costs arising from agency problems (Sandhya, 2010).[6] Finally, given the varied and dynamic nature of this class of funds, performance measurement is a challenge. While Morningstar, Dow Jones (DJ), and Standard & Poor's (S&P) have introduced benchmarks for the fund class, each utilizes a different methodology.

We compare the performance of a dynamic allocation heuristic with the returns of funds that have been in existence for the longest time period in each cohort. We also perform a traditional risk-adjusted performance analysis for each target date cohort using a simple asset allocation as well as the returns for all three benchmarks. Our analysis shows that the funds in general do not outperform either the institutional benchmarks or a simple index allocation either on an absolute or risk-adjusted basis.

2. Literature review

Several simulation studies have analyzed Life Cycle funds from the standpoint of whether fixed or changing asset allocations achieve investors' retirement targets. Meyaard and Templeton (2002) found a lack of support for target date funds. Using a simulation on the "100 – age" heuristic, their findings suggest Life Cycle funds generate returns similar to a 50% or 100% equity allocation. Using historical risk and return measures, which do not include the recent increased market volatility, they were able to build a case for the 100% equity portfolio. Pfau (2010) uses a Monte Carlo simulation and concludes that Life Cycle approaches achieve higher expected utility for investors with typical levels of risk aversion than do fixed asset allocations, while fixed percentages are preferred for investors with higher-risk tolerance. Further, in a model that includes nonfinancial assets (human capital, housing, and privately-held businesses), Kyrychenko (2008) shows that investors can attain desired lifetime expected returns with declining equity allocations as investors age. Schleef and Eisinger (2007) show that investors fail to achieve their retirement goals investing fixed periodic amounts over time in any of the commonly employed allocation schemes found within the finance literature.

Surz and Israelsen (2007/2008) point out the need to evaluate target date funds against a proper benchmark. They design a set of benchmarks based on existing mutual funds centering on four risk levels: defensive, conservative, moderate, and aggressive. They conclude that the current market practice fails to compare the risk and return performance of existing target date funds to appropriate benchmarks, thus calling into question the reporting of any performance attributes.

Sandhya (2010) identifies potential agency problems associated with target date funds. One such agency problem is that many fund families select sector funds based on the higher fees generated by the funds selected, which are passed onto Life Cycle investors in addition to fees for managing the Life Cycle fund itself. Comparing Life Cycle funds as an entire cohort to balanced funds, he shows that the underperformance of Life Cycle funds is because of these additional fees. The author shows that, on average, Life Cycle funds have a greater allocation to equity than balanced funds. Looking at the largest mutual fund families within the Life Cycle funds category shows that even the funds with imminent short target dates have about the same allocation as balanced funds.[6] In a conclusion similar to the finding of the Senate's Committee on Aging, Sandhya (2010) questions the suitability of Life Cycle funds as a default choice for automatic enrollment into 401(k) retirement plans. While Sandhya (2010) compares Life Cycle funds as a class across target dates in the aggregate, our analysis examines the characteristics of this fund class by target date.

Beyond mere disclosure problems, simulation studies show that under a variety of scenarios, the allocations in a Life Cycle fund investment may lead to deficits during retirement. Spitzer and Singh (2008) find that while Life Cycle funds may provide an appropriate allocation when the target date is far into the future, the allocations near and after retirement increase the risk of a shortfall in funds during the retiree's lifetime. Their simulation analysis, which includes two dynamic proxies where the equity allocation declines as the individual nears retirement, suggests that the fund allocation strategy needs to be revisited. Dolvin, Templeton, and Rieber (2010) analyze asset allocation schemes and recommend a static allocation until the investor nears retirement. Their simulations support using 100% equity until 10 years from retirement and then switching to an appropriate "base – age" allocation. This allocation scheme outperforms the largest Life Cycle fund families; the average target date fund; static allocations; and the dynamic "120 – age" and "100 – age" heuristics on a risk-adjusted basis in simulations. Our paper contributes to the target date literature by adding an empirical analysis of risk-adjusted Life Cycle fund returns and benchmarks at different target dates.

2.1. The Life Cycle fund market

The approximately $340 billion invested in the Life Cycle category of the mutual fund market is dominated by three players: Fidelity, Vanguard, and T. Rowe Price with 39%, 22%, and 16% of assets, respectively, as of May 2010. Forty-eight other fund families capture the remaining 23% of Life Cycle fund assets.[8] While each manager applies a similar overall philosophy of investing largely in equities, then reducing this amount in favor of an allocation to bonds as the fund nears its target date, each manager executes this "glide path" at a different pace and with widely divergent asset allocation. For example, Vanguard invests

in a total of five to seven underlying funds; T. Rowe Price invests in 17 funds; and Fidelity's Freedom Funds invest in over 20 funds. The representative underlying funds and their allocations for the 2010 and 2050 target dates are shown in Table 1. Table 1 illustrates how the strategies and investments vary among fund families.

Table 1 Life Cycle fund allocations to underlying funds

Vanguard[a]			
	Fund Name	2010 Fund	2050 Fund
1	Vanguard Total Bond Market II Index	40.3%	10.1%
2	Vanguard Total Stock Market Index	39.1%	71.9%
3	Vanguard European Stock Index	4.9%	8.8%
4	Vanguard Pacific Stock Index	2.7%	4.7%
5	Vanguard Emerging Markets Stock Index	2.6%	4.5%
6	Vanguard Inflation-Protected Securities	10.3%	
7	Vanguard Prime Money Market	0.1%	
T. Rowe Price[b]			
	Fund Name	2010 Fund	2050 Fund
1	T. Rowe Price Equity Index 500 Fund	27.9%	11.5%
2	T. Rowe Price Value Fund	4.9%	24.1%
3	T. Rowe Price Growth Stock Fund	4.1%	22.8%
4	T. Rowe Price International Stock Fund	3.2%	5.2%
5	T. Rowe Price Overseas Stock Fund	3.1%	5.0%
6	T. Rowe Price Intern. Growth & Income	3.0%	5.0%
7	T. Rowe Price Mid-Cap Value Fund	2.7%	4.5%
8	T. Rowe Price Mid-Cap Growth Fund	2.6%	4.3%
9	T. Rowe Price Emerging Markets Stock	1.8%	3.0%
10	T. Rowe Price Small-Cap Value Fund	1.4%	2.0%
11	T. Rowe Price Small-Cap Stock Fund	1.3%	2.0%
12	T. Rowe Price New Horizons Fund	1.2%	1.9%
13	T. Rowe Price New Income Fund	22.7%	5.7%
14	T. Rowe Price Short-term Income Fund	9.4%	0.0%
15	T. Rowe Price High Yield Fund	4.1%	1.1%
16	T. Rowe Price Emerging Markets Bond	3.8%	1.1%
17	T. Rowe Price International Bond Fund	2.8%	0.8%
Fidelity[c]			
	Fund Name	2010 Fund	2050 Fund
1	Fidelity Series All-Sector Equity Fund	6.19%	11.04%
2	Fidelity Series Large Cap Value Fund	6.14%	10.93%
3	Fidelity Disciplined Equity Fund	5.93%	10.53%
4	Fidelity Growth Company Fund	5.00%	8.87%
5	Fidelity Series 100 Index Fund	4.01%	7.11%
6	Fidelity Blue Chip Growth Fund	1.88%	3.36%
7	Fidelity Equity-Income Fund	1.86%	3.20%
8	Fidelity Series Small Cap Opportunities	1.03%	1.82%
9	Fidelity Small Cap Value Fund	0.63%	1.15%
10	Fidelity Small Cap Growth Fund	0.63%	1.12%
11	Fidelity Series Commodity Strategy Fund	3.91%	7.09%

(Continued)

Table 1 (Continued)

	Fund Name	2010 Fund	2050 Fund
12	Fidelity Overseas Fund	2.76%	5.21%
13	Fidelity Diversity International Fund	2.70%	5.15%
14	Fidelity Series International Value Fund	2.11%	3.76%
15	Fidelity Series International Growth Fund	2.08%	3.72%
16	Fidelity Series Emerging Markets Funds	1.60%	2.93%
17	Fidelity Europe Fund	0.61%	0.98%
18	Fidelity Japan Fund	0.40%	0.69%
19	Fidelity Series International Small Cap	0.38%	0.69%
20	Fidelity Series Investment Grade Bond	21.26%	0.45%
21	Fidelity Strategic Real Return Fund	5.45%	0.11%
22	Fidelity Total Bond Fund	0.84%	0.02%
23	Fidelity High Income Fund	2.53%	5.03%
24	Fidelity Capital & Income Fund	2.52%	5.00%
25	Fidelity Inflation-Protected Bond Index	7.20%	0.00%
26	Fidelity Short-term Bond Fund	5.12%	0.00%
27	Fidelity Institutional Money Market	5.11%	0.00%
28	Net other assets	0.10%	0.05%

This table shows the underlying funds and their allocations for the 2010 and 2050 target dates for the three largest Life Cycle fund families, Vanguard, T. Rowe Price, and Fidelity.

[a]Source: Vanguard. (https://personal.vanguard.com/us/funds/vanguard/TargetRetirementList#targetAnchor), as of May 31, 2010.

[b]Source: T. Rowe Price (http://individual.troweprice.com/public/Retail/Mutual-Funds/hProspectuses&Reports/Portfolio-Holdings), as of May 31, 2010.

[c]Source: Fidelity (http://personal.fidelity.com/global/search/inquira/resultsindex.shtml?question=fidelity%20freedom%20funds), as of May 31, 2010.

The underlying funds within the Life Cycle portfolios range from pure index funds (as represented by Vanguard's Target Retirement funds) to aggressively managed funds. The breadth of funds and allocations may benefit the investor: Liu, Chang, De Jong, and Robinson (2009) show through simulation that portfolios that include three classes of stocks (S&P 500, EAFE, and Russell 2000) plus bonds outperform those with one class of stocks for given fixed stock/bond allocations, even with high withdrawal rates. This would appear to give investors the benefit of choice. In reality, if an employer offers a menu of funds through a single fund family, a 401(k) investor who wants a Life Cycle option is buying into whatever Life Cycle strategy and underlying investments that fund family offers.

2.2. *Fees*

Table 2 shows average fund expenses and fees as of May 2010 based on data from FactSet. Funds are divided by target year and fund class. Loads may be charged to the investor either at the time of purchase or at the time of withdrawal. These vary according to the type of fund and the way it is sold. Only the A Class funds have a front end load (a sales charge that the buyer pays to acquire an asset). This charge is taken out of the initial investment. Therefore, only the net amount goes into the investment. The front load has a

Table 2 Average expenses and fees

	Expense ratio	Management fee	CDSC	Front-end load	12b-1 fee	Redemption fee
By fund year						
2010	1.15	0.16	2.37	5.46	0.47	1.17
2020	1.24	0.21	2.42	5.48	0.48	1.14
2030	1.27	0.21	2.48	5.47	0.48	1.14
2040	1.28	0.21	2.42	5.47	0.47	1.14
2050	1.27	0.23	2.35	5.46	0.47	1.00
By fund class						
A	1.17	0.22		5.47	0.25	1.00
B	1.91	0.17	4.74		0.97	1.00
C	1.90	0.27	1.00		0.97	1.00
I	0.77	0.28			0.00	
R, R1-R6	1.11	0.15			0.32	1.00

Source: FactSet, May 2010.

This table shows average fund expenses and fees in basis points. Funds are divided by retirement target year and fund share class. CDSC is a deferred sales charge or back-end load, paid when the investor redeems shares within a certain amount of time, and usually declines over time. Front-end load is a sales charge deducted from the initial investment. The 12b-1 fee is an annual marketing fee. Redemption fee is an amount charged when the investor sells shares.

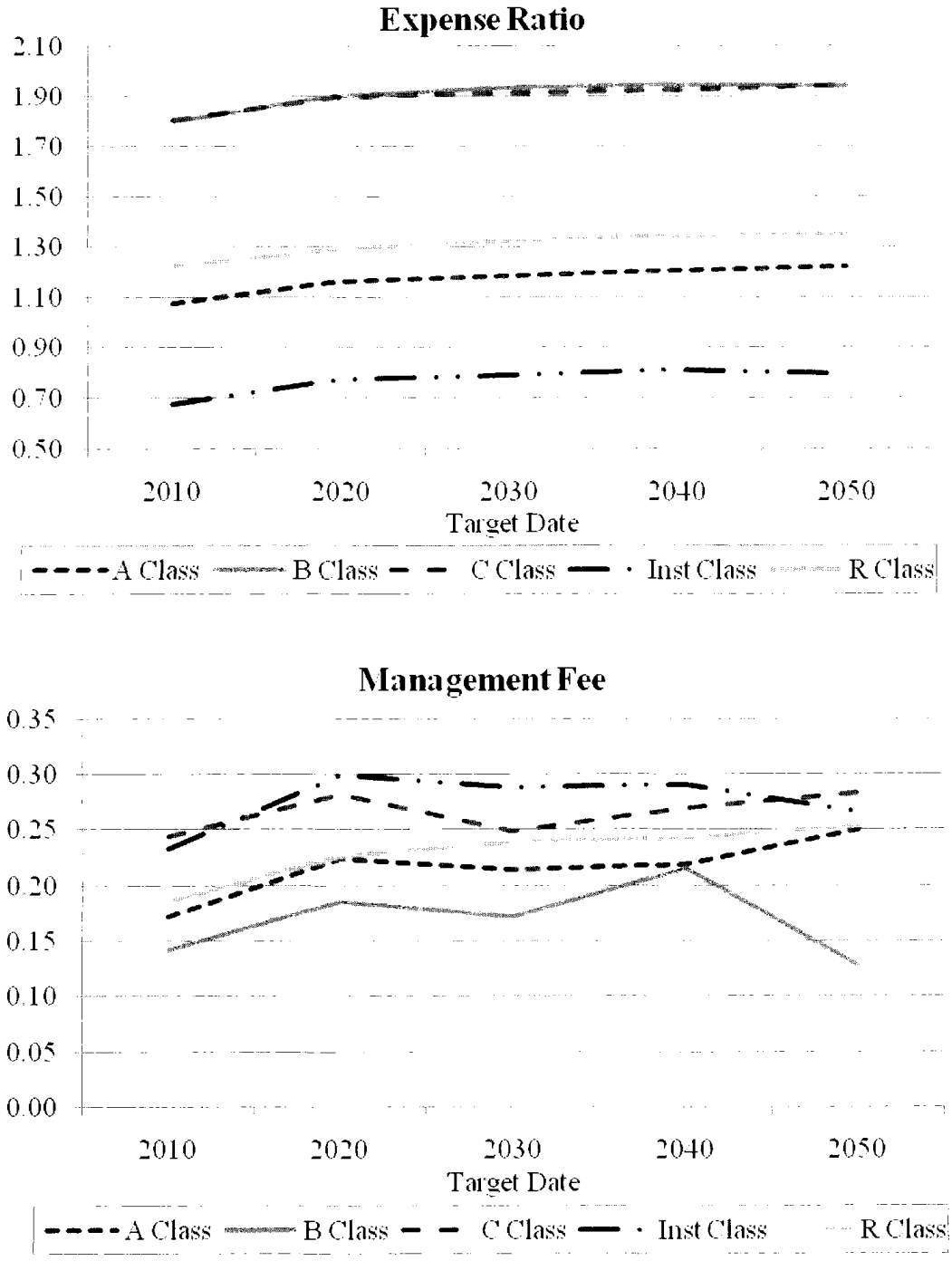
mean of 5.47% (median of 5.75%) with a range of 4.75% to 5.75%. Loads can also be back-ended, where the fee is charged at withdrawal. The B and C Class funds have deferred sales charges (CDSCs or back-end loads), a sales charge that is applied when the fund is sold, which typically decreases the longer the investment is held. The deferred sales charge for the B Class is 4% or 5% and the C Class is 1%. Both the B and C Classes also have a redemption fee averaging 1%. They also have an average annual 12b-1 fee (a marketing and distribution fee deducted annually from the fund's assets) ranging from 95 to 98 basis points (not displayed). The R classes (R, R1-R6), which are the classes usually offered through 401(k) plans, charge a 12b-1 fee ranging from 0 basis points for the R6 classes to 58 basis points for the R1 class. They also have average expense ratios ranging from 49 to 149 basis points (not displayed).

Fig. 1 shows the patterns for the mean of expense ratios and management fees by share class across target dates. Management fees and expense ratios generally fall as the target date approaches. The management fees have a less discernible pattern across target dates. Expense ratios are lowest, but management fees are highest, for the Institutional class.

3. Data and methods

3.1. Benchmarks

We examine three sets of institutional benchmarks for Life Cycle funds. The first set of benchmarks, DJ Target Date Indexes, is composed of two series: the Global Series and the U.S. Series. There is one index for each target date from 2010 through 2055 in five-year



Source: FactSet, May 2010.

Fig. 1. Expense ratios and management fees for Life Cycle funds. These graphs show the trends in expense ratios and management fees across fund target dates by share class.

increments, plus a "Today" index. Both series are rebalanced based on the risk and return behavior of the underlying equity index and the time until the index's target date. The underlying indexes for the Global Series are nine DJ equity indexes (three international), four

Barclay's fixed income indexes (one international), and a Barclay's cash index. The underlying indexes for the U.S. Series are the same domestic equity, fixed income, and cash indexes as for the Global Series (six equity, three bond, and one cash index). The allocation is changed every five years to have a declining percentage of the risk from the highest performing equity index component.[9]

The second set of benchmarks are S&P's Target Date Indexes, which have target dates in five-year increments from 2010 to 2040. The Target Date Indexes are structured from nine multi-asset class indices. To ensure that the benchmarks are representative of actual investment opportunities, S&P utilizes exchange traded funds (ETFs) as proxies for the underlying asset classes. The allocations are determined by the average allocations of the target date funds in the industry, so the weights are based on those of the peer group. To eliminate the chance of outliers, S&P requires that each asset class in the index series must be utilized by at least 25% of the target date fund sponsors. The underlying sectors are five equity sectors (two of which are international sectors), three fixed income sectors, and a real estate sector.[10]

The final set of benchmarks, Morningstar's Lifetime Allocation Indexes, is based on mean-variance analysis and the Sharpe ratio. Allocations are determined by different levels of risk (aggressive, moderate, and conservative) in addition to the remaining time to the target date (2000 to 2055, in five-year increments). This methodology, developed and maintained by Ibbotson Associates, is consistent with the analysis of Viceira (2007). The underlying sectors are Morningstar equity indexes (domestic, international, and emerging market) and debt indexes (international fixed income debt, long-term domestic fixed income bonds, and TIPs), plus commodities.[11]

Because the funds never "mature," any investor who stays in a 2010 fund past the target date year appears to switch to a static allocation. Surz and Israelsen (2007/2008) show that a "through" the target date allocation of this type creates a much higher risk profile than a "to" the target date allocation, which has a glide path that ends in a 100% allocation to TIPs and Treasury bills at the assumed retirement date.

3.2. Rolling return analysis

First, we analyze the performance over time of the longest existing funds. We construct a benchmark for each target date to account for the fact that funds have changing asset allocations through time. The indexes we use to compare with the rolling returns for each target date (the "Rolling Indexes") assume that the equity allocation, represented by the S&P 500 Index, is 100 – age, with the remainder in the Barclay's Capital Government Credit (BCGC) Index. All the fund returns and data underlying the Rolling Indexes are from FactSet. The Rolling Indexes assume retirement at age 62[12] in May, 2010 (so an investor in a 2010 Target Date fund in April 2001 would be approximately nine years to retirement and therefore 52.9 years old; an individual investing in a 2020 fund in April 2001 would be 52 in May 2010; in a 2030 fund would be 42, and so forth).

The Rolling Indexes work as follows: an investor in a 2010 fund would reach age 62 in May 2010 (the latest return data available). Because his age in April 2001 would be 52.9 years, his Rolling Index allocation would be 47.1% to the S&P 500/52.9% to the BCGC Index. The percentage to equity would decline each month, so, for example, in May 2002,

Table 3 Rolling returns descriptive statistics

Panel A: April 2001–May 2010 Period

	Avg	Min	Max	SD	Cum Ret	Geo Mean
2010 Funds	0.30	−11.44	5.91	2.44	$1.35	0.27
Rolling Index10	0.36	−8.16	4.30	2.03	$1.45	0.34
Mstar Con 2010	0.54	−9.03	4.68	2.01	$1.76	0.52
Mstar Mod 2010	0.53	−11.71	5.53	2.76	$1.71	0.49
Mstar Agg 2010	0.51	−14.42	7.62	3.55	$1.64	0.45
2020 Funds	0.27	−14.61	7.70	3.33	$1.26	0.21
Rolling Index20	0.33	−9.59	5.02	2.44	$1.39	0.30
Mstar Con 2020	0.55	−11.30	5.58	2.70	$1.76	0.51
Mstar Mod 2020	0.54	−14.76	7.95	3.66	$1.67	0.47
Mstar Agg 2020	0.52	−17.43	9.94	4.35	$1.59	0.42
2030 Funds	0.29	−16.57	9.60	3.83	$1.27	0.22
Rolling Index30	0.31	−11.02	5.73	2.86	$1.34	0.26
Mstar Con 2030	0.56	−14.78	8.03	3.61	$1.72	0.49
Mstar Mod 2030	0.54	−17.68	10.20	4.35	$1.62	0.44
Mstar Agg 2030	0.52	−19.07	11.21	4.70	$1.57	0.41
2040 Funds	0.29	−17.94	10.68	4.27	$1.25	0.20
Rolling Index40	0.28	−12.45	6.67	3.31	$1.28	0.22
Mstar Con 2040	0.57	−17.00	9.75	4.10	$1.69	0.48
Mstar Mod 2040	0.55	−18.67	10.98	4.57	$1.63	0.45
Mstar Agg 2040	0.54	−19.44	11.54	4.79	$1.60	0.43

Panel B: April 2005-May 2010 Period

	Avg	Min	Max	SD	Cum Ret	Geo Mean
2010 Funds	0.22	−11.44	5.91	2.84	$1.12	0.18
Rolling Index10	0.34	−8.16	4.10	2.16	$1.21	0.31
Mstar Con 2010	0.44	−9.03	4.29	2.15	$1.29	0.41
Mstar Mod 2010	0.43	−11.71	5.53	2.88	$1.27	0.38
Mstar Agg 2010	0.40	−14.42	7.62	3.68	$1.23	0.34
DJ 2010 Index	0.39	−8.47	4.60	2.05	$1.26	0.37
2020 Funds	0.20	−14.61	7.70	3.70	$1.09	0.13
Rolling Index20	0.31	−9.59	4.87	2.55	$1.19	0.28
Mstar Con 2020	0.45	−11.30	5.26	2.81	$1.29	0.41
Mstar Mod 2020	0.43	−14.76	7.95	3.80	$1.24	0.35
Mstar Agg 2020	0.39	−17.43	9.94	4.58	$1.19	0.28
DJ 2020 Index	0.40	−12.68	7.18	3.15	$1.25	0.35
2030 Funds	0.22	−16.57	9.60	4.34	$1.08	0.12
Rolling Index30	0.28	−11.02	5.73	2.97	$1.16	0.23
Mstar Con 2030	0.45	−14.78	8.03	3.82	$1.26	0.37
Mstar Mod 2030	0.41	−17.68	10.20	4.66	$1.20	0.30
Mstar Agg 2030	0.38	−19.07	11.21	5.07	$1.17	0.25
DJ 2030 Index	0.43	−16.59	10.67	4.34	$1.23	0.33
2040 Funds	0.21	−17.94	10.68	4.77	$1.06	0.09
Rolling Index40	0.25	−12.45	6.67	3.40	$1.13	0.19
Mstar Con 2040	0.43	−17.00	9.75	4.46	$1.23	0.33
Mstar Mod 2040	0.41	−18.67	10.98	4.95	$1.19	0.29
Mstar Agg 2040	0.40	−19.44	11.54	5.18	$1.18	0.26
DJ 2040 Index	0.44	−18.67	12.64	5.00	$1.21	0.31

Continued

Table 3 (Continued)

Panel C: June 2006-May 2010 Period

	Avg	Min	Max	SD	Cum Ret	Geo Mean
2010 Funds	0.13	−11.44	5.91	3.17	$1.04	0.08
Rolling Index10	0.33	−8.16	4.10	2.40	$1.15	0.30
Mstar Con 2010	0.42	−9.03	4.29	2.38	$1.20	0.39
Mstar Mod 2010	0.34	−11.71	5.53	3.18	$1.15	0.29
Mstar Agg 2010	0.25	−14.42	7.62	4.05	$1.08	0.17
DJ 2010 Index	0.36	−8.47	4.60	2.28	$1.17	0.33
S&P Target 2010	0.29	−10.16	4.53	2.90	$1.13	0.25
2020 Funds	0.05	−14.61	7.70	4.11	$0.98	−0.03
Rolling Index20	0.27	−9.59	4.87	2.84	$1.12	0.23
Mstar Con 2020	0.38	−11.30	5.26	3.10	$1.17	0.33
Mstar Mod 2020	0.27	−14.76	7.95	4.17	$1.09	0.18
Mstar Agg 2020	0.17	−17.43	9.94	5.03	$1.02	0.04
DJ 2020 Index	0.27	−12.68	7.18	3.45	$1.11	0.21
S&P Target 2020	0.17	−13.07	6.50	3.81	$1.05	0.10
2030 Funds	0.04	−16.57	9.60	4.83	$0.96	−0.08
Rolling Index30	0.22	−11.02	5.73	3.31	$1.08	0.16
Mstar Con 2030	0.29	−14.78	8.03	4.20	$1.10	0.20
Mstar Mod 2030	0.18	−17.68	10.20	5.12	$1.02	0.05
Mstar Agg 2030	0.13	−19.07	11.21	5.56	$0.99	−0.03
DJ 2030 Index	0.22	−16.59	10.67	4.75	$1.05	0.11
S&P Target 2030	0.11	−15.40	8.42	4.59	$1.00	0.00
2040 Funds	0.01	−17.94	10.68	5.30	$0.94	−0.13
Rolling Index40	0.17	−12.45	6.67	3.78	$1.05	0.09
Mstar Con 2040	0.23	−17.00	9.75	4.91	$1.05	0.11
Mstar Mod 2040	0.17	−18.67	10.98	5.43	$1.01	0.02
Mstar Agg 2040	0.14	−19.44	11.54	5.68	$0.99	−0.03
DJ 2040 Index	0.19	−18.67	12.64	5.48	$1.02	0.04
S&P Target 2040	0.07	−16.77	9.60	5.05	$0.97	−0.06

These tables show descriptive statistics for 10 2010 Target Date funds; 14 2020 Target Date funds; 11 2030 Target Date funds; and 11 2040 Target Date funds, based on the average of monthly fund returns in each category. The Rolling Indexes assume the investor will be 62 at the target date and use an allocation of 100–age in the S&P 500 Index, with the remainder in the BCGC Index, rebalanced monthly. The other benchmarks are the Morningstar Conservative, Moderate, and Aggressive Lifetime Allocation Indexes, which begin before April 2001; the DJ Target Date Indexes, which begin in April 2005; and the S&P Target Date Indexes, which began in June 2006.

the investor would be 54 years old, and therefore the 2010 Rolling Index would have 46% allocated to equity in that month. Similarly, an investor in a 2020 fund would be 44 years old in May 2002, so the 2020 Rolling Index would have 56% allocated to equity in that month. The Rolling Indexes are rebalanced every month. The purpose of creating the Rolling Indexes is to have an explicitly dynamic asset allocation replicating a typical glide path. If the funds' allocation to subsectors affords diversification benefits beyond our simple equity/bond allocation, this should result in outperformance of the funds. We include the DJ Target Date Indexes, the Morningstar Lifetime Allocation Conservative, Moderate, and Aggressive Funds, and the S&P Target Date Indexes as additional benchmarks.

The funds chosen for analysis were A, B, C, I, and R classes in the Target Date Fund category using FactSet fund screening. These are the major fund classes that represent the

range of fees and expenses that investors face. We use monthly returns, net of expenses, but gross of fees. The returns for the DJ Indexes, the S&P 500 Index, and the BCGC Index, as well as all the fund returns, are from FactSet. Data for the Morningstar Lifetime Allocation and S&P Target Date Indexes comes from Morningstar EnCorr.

For the rolling return analysis, we selected the funds with the longest history, going back to at least April 2001. This yielded a sample of ten 2010 funds; fourteen 2020 funds; and eleven each of 2030 and 2040 funds, some of which are multiple classes of each fund (each class that has different expenses therefore has different returns). The fund families include American Independent, Blackrock, DWS, Fidelity, Principal, and Wells Fargo. Although these are small samples, we present this as an experiment to compare the long-term performance an investor would have earned in a target date fund with what he would have earned using a simple allocation scheme. Because the FactSet database does not include funds that have terminated, there may be a survivorship bias, but if the worst funds are the ones that would close, we would expect to see the fund cohort outperform the indexes. We do not perform any statistical tests on these results, because most target date cohorts do not have 30 or more funds until 2006 or 2007.

Table 3 shows the funds' average performance from April 2001, from April 2005 when the DJ Indexes became available, and from June 2006 when the S&P Target Indexes became available. On average the funds in existence from April 2001 performed worse than the simple Rolling Index and the more complicated benchmarks. In general, the Rolling Index showed higher average returns and less risk than the surveyed funds over all three periods. The only exception was the April 2001 through May 2010 period, when the 2040 funds had a slightly higher average return (0.29% vs. 0.28% for the surveyed funds and the Rolling Index, respectively), but with a higher standard deviation. The Rolling Index also shows a more conservative risk and return profile compared with the other benchmarks across all three time periods, particularly for the later target dates.

The variation among the Morningstar funds is visible in the table. In all cases, the range and standard deviation for the three benchmarks are consistent with their philosophy. That is, the order of riskiness from low to high is Conservative, Moderate, and Aggressive. However, the returns produced are not always consistent with the underlying objectives. For instance, the Conservative benchmarks generally outperform both the Moderate and Aggressive benchmarks in terms of average, cumulative, and geometric return in all periods. The Morningstar Indexes outperform the Rolling Index over the April 2001 through May 2010 period and less so for the April 2005 through May 2010 period. For the most volatile period, June 2006 through May 2010, the Rolling Index posts a similar cumulative return as the Conservative Index, but with less risk.

The DJ Index outperforms the surveyed funds with less risk in over both periods beginning April 2005 and June 2006. Its risk and return profile is similar to that of the Morningstar Moderate Indexes. When compared with the Rolling Index, the DJ Index shows an equal or higher cumulative return, for the period April 2005 through May 2010, but an equal or slightly lower cumulative return for the period June 2006 through May 2010.

The S&P Target Indexes performed worse than the other benchmarks on average based on return and risk (as measured by the standard deviation of monthly returns) from its inception in June 2006. The S&P Target Date Indexes may be a noisy benchmark: Aber, Li, and Can

Table 4 Asset allocations for the largest target date fund families

Panel A: U.S. equity/bond allocation					
Target date	2010	2020	2030	2040	2050
Years to retirement	0	10	20	30	40
Equity					
Vanguard[a]	50%	67%	82%	90%	90%
T Rowe Price[b]	59%	75%	87%	91%	91%
Fidelity[c]	48%	63%	78%	83%	90%
Average	52%	68%	82%	88%	90%
Bond					
Vanguard	50%	33%	18%	10%	10%
T Rowe Price	42%	25%	13%	8%	9%
Fidelity	52%	37%	23%	17%	10%
Average	48%	32%	18%	12%	10%
Panel B: U.S. equity/international equity/bond allocation					
Target Date	2010	2020	2030	2040	2050
Years to retirement	0	10	20	30	40
U.S. Equity					
Vanguard	40%	54%	66%	72%	72%
T Rowe Price	47%	59%	69%	72%	72%
Fidelity	38%	51%	62%	66%	71%
Average	42%	55%	66%	70%	72%
International equity					
Vanguard	10%	13%	16%	18%	18%
T Rowe Price	12%	16%	18%	19%	19%
Fidelity	10%	13%	15%	17%	19%
Average	11%	14%	16%	18%	19%
Bond					
Vanguard	50%	33%	18%	10%	10%
T Rowe Price	42%	25%	13%	8%	9%
Fidelity	52%	37%	23%	17%	10%
Average	48%	32%	18%	12%	10%

This table shows the asset allocations for the three major Life Cycle fund families (based on assets under management as of May 31, 2010), by target year. Columns may not add to 100% because of rounding.

[a]Source: Vanguard (https://personal.vanguard.com/us/funds/vanguard/TargetRetirementList#targetAnchor), as of May 31, 2010.

[b]Source: T. Rowe Price (http://individual.troweprice.com/public/Retail/Mutual-Funds/Prospectuses&Reports/Portfolio-Holdings), as of May 31, 2010.

[c]Source: Fidelity (http://personal.fidelity.com/global/search/inquira/resultsindex.shtml?question=fidelity%20freedom%20funds), as of May 31, 2010.

(2009) have shown that ETFs exhibit tracking error versus their underlying indices; tend to trade at a premium; and have more daily price volatility. However, the index still outperformed the surveyed funds, and with less risk, for all target dates.

Analysis of the longest outstanding Life Cycle funds shows that their performance does not compare favorably to either a simple equity/bond "glide path" allocation, or to the more complicated institutional benchmarks. The poor performance of the surveyed funds suggests that if there is any survivorship bias in that sample, it is not overstating performance.

3.3. Risk-adjusted return analysis

Next, we constructed indexes based on the average allocations over various target dates of the Vanguard, Fidelity, and T. Rowe Price funds (as of May 2010). We chose these three fund families since they dominate the market in terms of assets under management. Table 4 shows that even among these three top fund families, the range of allocations is large. For example, the bond allocation for the 2030 target date ranges from 13% for T. Rowe Price to 23% for Fidelity.

We compare the monthly returns of the A, B, C, I, and R class funds (with target dates 2010, 2020, 2030, 2040, and 2050) with indexes built with asset allocations across both U.S. equities and bonds (Ind20xx) and U.S. equities, bonds, and international equities (All20xx). We assume the percentage allocation to be constant through time. Most funds have only been in existence a short time (the oldest funds being from December 2000). Further, the allocations for the furthest target dates do not change much. The percentage change in equity allocation is 23% from the 2020 target date (68%) to the 2010 date (52%), but only 2% from 2050 (90%) to 2040 (88%) and 6% from 2040 (88%) to 2030 (82%). Similar changes exist between the indices that include the international component. Given the stability of the allocations, a constant allocation for each target date is a reasonable assumption.

The Ind20xx indexes are based on the average equity and bond allocations for each target date across the three fund families, with the S&P 500 Index representing the equity allocation

Table 5 Monthly returns for target date funds

	Allocation			Summary statistics							
	U.S. equity	Bonds	Int'l equity	*N*	Mean	Min	Q1	Median	Q3	Max	SD
2010 funds				114	0.29	−12.16	−0.95	0.72	1.83	6.22	2.52
Ind2010	52%	48%		114	0.29	−9.94	−1.02	0.51	1.75	5.08	2.46
All2010	42%	48%	11%	114	0.32	−10.33	−0.89	0.60	1.67	5.45	2.51
2020 funds				114	0.22	−14.88	−1.48	0.80	2.33	7.74	3.40
Ind2020	68%	32%		114	0.23	−12.22	−1.35	0.69	2.12	6.57	3.16
All2020	55%	32%	14%	114	0.26	−12.74	−1.35	0.82	2.16	7.07	3.21
2030 funds				114	0.22	−17.12	−1.77	0.97	2.74	9.59	3.97
Ind2030	82%	18%		114	0.17	−14.22	−1.51	0.77	2.53	7.88	3.80
All2030	66%	18%	16%	114	0.21	−14.82	−1.70	0.87	2.43	8.47	3.85
2040 funds				114	0.20	−18.09	−1.85	1.15	2.94	10.62	4.38
Ind2040	88%	12%		114	0.15	−15.08	−1.60	0.84	2.68	8.45	4.07
All2040	70%	12%	18%	114	0.19	−15.70	−1.79	0.96	2.40	9.06	4.12
2050 funds				110	0.35	−18.44	−1.77	1.16	3.25	11.11	4.35
Ind2050	90%	10%		110	0.23	−15.37	−1.63	0.93	2.73	8.63	4.12
All2050	72%	10%	19%	110	0.28	−16.04	−1.76	0.96	2.42	9.29	4.18

This table shows descriptive statistics for monthly returns of Life Cycle funds by target date. Indexes are built with static asset allocations across U.S. equities and bonds (Ind20xx) and U.S. equities, bonds, and international equities (All20xx). The percentage allocation is assumed to be constant through time. Allocations for the benchmarks are based on the average allocation of the Vanguard, Fidelity, and T. Rowe Price funds in each target date category. U.S. equity is represented by the S&P 500 Index; Bonds the BCGC Index; Int'l Equity by the MSCI EAFE Index.

Table 6 Sharpe Ratios for Target Date Funds

	Allocation			Summary statistics						
	U.S. equity	Bonds	Int'l equity	*N*	Mean	Min	Q1	Median	Q3	Max
2010 funds				114	0.06	−3.65	−0.37	0.14	0.48	3.81
Ind2010	52%	48%		114	0.06	−3.83	−0.45	0.13	0.57	3.95
All2010	42%	48%	11%	114	0.07	−3.92	−0.39	0.14	0.58	3.81
2020 funds				114	0.03	−3.54	−0.42	0.17	0.58	2.61
Ind2020	68%	32%		114	0.03	−3.77	−0.49	0.13	0.58	3.01
All2020	55%	32%	14%	114	0.04	−3.87	−0.45	0.15	0.56	2.90
2030 funds				114	0.03	−3.44	−0.42	0.18	0.58	2.24
Ind2030	82%	18%		114	0.01	−3.70	−0.46	0.15	0.61	2.42
All2030	66%	18%	16%	114	0.02	−3.80	−0.48	0.17	0.52	2.37
2040 funds				114	0.02	−3.36	−0.44	0.19	0.58	1.91
Ind2040	88%	12%		114	0.01	−3.66	−0.45	0.17	0.61	2.21
All2040	70%	12%	18%	114	0.02	−3.78	−0.47	0.17	0.52	2.16
2050 funds				110	0.06	−2.99	−0.38	0.19	0.58	1.92
Ind2050	90%	10%		110	0.03	−3.70	−0.44	0.18	0.62	2.18
All2050	72%	10%	19%	110	0.04	−3.81	−0.44	0.19	0.54	2.16

This table shows descriptive statistics for the Sharpe ratios of Life Cycle funds by target date. Indexes are built with static asset allocations across U.S. equities and bonds (Ind20xx) and U.S. equities, bonds, and international equities (All20xx). The percentage allocation is assumed to be constant through time. Allocations for the benchmarks are based on the average allocation of the Vanguard, Fidelity, and T. Rowe Price funds in each target date category. U.S. equity is represented by the S&P 500 Index; Bonds the BCGC Index; Int'l Equity by the MSCI EAFE Index.

and the BCGC Index representing the bond allocation. The All20xx indexes are based on the average U.S. equity/international equity/bond allocations for each target date, with the S&P 500 Index representing the domestic equity allocation, the MSCI EAFE Index representing the international equity allocation, and the BCGC representing the bond allocation.

The returns in Table 5 are negatively skewed for both the funds and the indexes, but more so for the funds. The short-dated funds (2010 and 2020) underperform the indexes on average. Within the 2010 target date, the mean return is less than or equal to the two benchmark comparisons but the range and standard deviation are much larger. Within the three longer dated cohorts, the overall average of the representative funds is higher than both the benchmark allocation funds, but with more risk as shown by the larger range of returns and higher standard deviation.

The risk-adjusted performance, represented by Sharpe ratios in Table 6 is also negatively skewed for both the funds and the indexes. The funds' risk-adjusted performance is comparable with the indexes. Only the 2050 target date funds outperform the indexes by more than one basis point. For the most part, close to 50% of target date funds have Sharpe ratios within one or two basis points of the indexes. The range of risk-adjusted return is smaller for the funds when compared with the indices across all five target dates. Given that most classes have a load or annual 12b-1 fee, these funds would likely provide a negative risk-adjusted return after fees.

Because the advantage of target date funds is that they allocate among sectors, the fund's alpha should be a powerful measure of whether the fund adds value. We test a two-factor

Table 7 Two-factor model for target date funds

	N	Mean	Min	Median	Max	SD	Number significant and positive	Number significant and negative
2010 funds								
Number of observations		57	32	48	114			
alpha	93	−0.0019	−0.2843	−0.0022	0.2471	0.1199	8	2
SPX beta	93	0.5951	0.2953	0.6147	0.9045	0.1451	93	0
BCGC beta	93	0.3450	−0.0651	0.3565	0.6808	0.1441	82	0
2020 funds								
Number of observations		60	32	56	114			
alpha	107	−0.0068	−0.3906	0.0013	0.2685	0.1166	2	4
SPX beta	107	0.7664	0.2883	0.7562	1.0219	0.1268	107	0
BCGC beta	107	0.2930	−0.0398	0.2737	1.3856	0.2133	83	0
2030 funds								
Number of observations		59	32	56	114			
alpha	104	0.0055	−0.2821	0.0050	0.1903	0.0924	0	2
SPX beta	104	0.9258	0.7299	0.9179	1.0678	0.0835	104	0
BCGC beta	104	0.1790	−0.1716	0.1797	0.4159	0.1058	41	0
2040 funds								
Number of observations		59	32	56	114			
alpha	94	0.0094	−0.2641	0.0047	0.1881	0.0964	0	1
SPX beta	94	0.9857	0.8423	0.9992	1.0856	0.0671	94	0
BCGC beta	94	0.1396	−0.0149	0.1265	0.3985	0.0855	13	0
2050 funds								
Number of observations		48	32	39	110			
alpha	52	0.0124	−0.2731	0.0038	0.2474	0.1039	0	0
SPX beta	52	1.0022	0.9047	1.0226	1.0759	0.0605	52	0
BCGC beta	52	0.1569	0.0477	0.1437	0.3984	0.0909	6	0

This table shows the results of the two-factor model $R_{it} = \alpha + \beta_1 * SPX_t + \beta_2 * BCGC_t + \epsilon_i$. In the two-factor model, R_{it} is the excess return in month t on fund i. SPX is the excess return of the S&Ps 500 Index and BCGC is the excess return of the BCGC Index. Excess return is defined as the monthly return less the return on the Barclays Capital Treasury Bill Index. The number of observations refers to the number of monthly observations on the N funds in the cohort.

model and three-factor model similar to Jensen (1968) and Sandhya (2010). Excess return is defined as the monthly return less the return on the Barclays Capital Treasury Bill Index. In the two-factor model, the indexes are the S&Ps 500 Index and the BCGC. We eliminated 177 of the 527 funds because they had 30 months or less of returns. The three-factor model adds the MSCI EAFE index (EAFE). Our model is represented by Eq. (1):

$$R_{it} = a_i + \sum_{j=1}^{J} \beta_{ij} I_{jt} + \varepsilon_i \tag{1}$$

where

R_{it} = excess return of fund i in month t

Table 8 Three-factor model for target date funds

	N	Mean	Min	Median	Max	SD	Number significant and positive	Number significant and negative
2010 funds								
Number of observations		57	32	48	114			
alpha	93	0.0265	−0.2392	0.0149	0.3224	0.1249	18	6
SPX beta	93	0.4136	0.1906	0.4011	0.6012	0.0954	93	0
BCGC beta	93	0.2686	−0.2264	0.2518	0.6606	0.1563	68	0
EAFE beta	93	0.1682	0.0403	0.1633	0.3622	0.0673	92	0
2020 funds								
Number of observations		60	32	56	114			
alpha	107	0.0227	−0.3749	0.0129	0.3247	0.1293	16	8
SPX beta	107	0.5365	0.3912	0.5192	0.7114	0.0719	107	0
BCGC beta	107	0.1995	−0.2467	0.1396	1.4342	0.2401	51	0
EAFE beta	107	0.2132	−0.1441	0.2169	0.4453	0.0861	104	0
2030 funds								
Number of observations		59	32	56	114			
alpha	104	0.0403	−0.2485	0.0177	0.3229	0.1175	17	7
SPX beta	104	0.6359	0.4771	0.6482	0.7839	0.0669	104	0
BCGC beta	104	0.0620	−0.3768	0.0415	0.3327	0.1240	19	0
EAFE beta	104	0.2683	0.1468	0.2690	0.4791	0.0657	104	0
2040 funds								
Number of observations		59	32	56	114			
alpha	94	0.0430	−0.1825	0.0170	0.3366	0.1165	15	0
SPX beta	94	0.6807	0.4847	0.6961	0.8389	0.0686	94	0
BCGC beta	94	0.0190	−0.0992	0.0007	0.3122	0.0919	7	0
EAFE beta	94	0.2822	0.1521	0.2861	0.5113	0.0660	91	0
2050 funds								
Number of observations		48	32	39	110			
alpha	52	0.1120	−0.1092	0.1371	0.4129	0.1349	11	0
SPX beta	52	0.6656	0.4918	0.6703	0.8224	0.0730	52	0
BCGC beta	52	0.0007	−0.1212	−0.0333	0.3097	0.1112	4	0
EAFE beta	52	0.3123	0.1510	0.3097	0.5365	0.0733	47	0

This table shows the results of the three-factor model $R_{it} = \alpha + \beta_1 * SPX_t + \beta_2 * BCGC_t + \beta_3 * EAFEt + \epsilon_i$. In the three-factor model, R_{it} is the excess return in month t on fund i. SPX is the excess return of the S&Ps 500 Index, BCGC is the excess return of the BCGC Index, and EAFE is the excess return on the EAFE index. Excess return is defined as the monthly return less the return on the Barclays Capital Treasury Bill Index. The number of observations refers to the number of monthly observations on the N funds in the cohort.

α_i = manager risk-adjusted excess return of fund i
β_{ij} = sensitivity of fund i to index j
I_{jt} = excess return of the index j in month t
ε_i = unexplained excess return for fund i.

The results in both Tables 7 and 8 show that target date funds do not add much value over the market indexes. In the two-factor model, only eight of the 2010 funds and two of the 2020 funds have positive and significant alpha (four at the 5% level of significance; four at the

10% level of significance, not displayed). The other nine significant alphas (out of a total of 350 funds tested) are negative (two at the 1% level of significance; four at the 5% level of significance; three at the 10% level of significance). The sensitivity of all of the funds to the S&P 500 Index was significantly different from zero. The betas echo the various target years' allocations to the index. The sensitivity to the BCGC is less strong: the number of betas that are significantly different from zero declines as the target date lengthens. This could be because of the diversity of fixed income subsectors in which target date funds invest.

The results for the three-factor model are similar. In each target year, 18 funds or fewer have positive alpha (overall six funds at the 1% level of significance; 27 at the 5% level of significance; 44 at the 10% level of significance, for a total of 77). Twenty-one funds have negative alpha (five at the 1% level of significance; six at the 5% level of significance; 10 at the 10% level of significance). All of the betas to the S&P 500 Index are significant and positive, and are close to the allocation to the S&P 500 Index. All but 13 of the EAFE betas are also significant and positive, with an average sensitivity close to the allocation. Sixty-eight of the 93 2010 funds have a positive and significant BCGC beta. On both a raw and risk-adjusted basis, the Life Cycle funds add little if any value over a simple allocation to index funds. The static index analysis reinforces our conclusion from the small rolling sample.

4. Conclusion

Seventy-one percent of 401(k) plan participants are offered Life Cycle funds.[13] Unfortunately, this category of funds has weak disclosure in terms of asset allocation methodology, composition, and timing. Some families of funds are more forthcoming than others, but as the Senate's investigation has uncovered, this lack of disclosure makes it difficult to evaluate the performance in terms of return versus the risk exposure. Our analysis helps to highlight the problems of disclosure and performance that face many individuals investing for retirement.

As in other classes of mutual funds, investors are subject to one-time and annual fees. Life Cycle investors may absorb not only the expenses of the underlying constituent funds, but also a management fee for the overall fund. These additional expenses can further erode performance. The glide path of broad asset allocation varies across fund families, as do the subclasses included in the equity/bond mix. Even the institutional benchmarks from DJ, Morningstar, and S&P exhibit a wide range of approaches to creating a standard for performance measurement.

Using these benchmarks, and indexes that we constructed, we show that, like many other categories of mutual funds, Life Cycle funds add little value on a risk-adjusted basis. The funds exhibit low risk-adjusted performance on average using both the Sharpe ratio and Jensen's alpha. Further, in an analysis measuring performance since April 2001 using the longest existing Life Cycle funds, these funds generally underperformed even a simple two-sector benchmark with a dynamic asset allocation. Our results suggest that individuals with a long time horizon may want to consider whether the apparent convenience of Life Cycle funds outweighs the difficulties in measuring and attaining return.

Notes

1. Investment Company Institute 2011 Factbook: http://www.ici.org/pdf/2011_factbook.pdf.
2. Recent activity by the Senate's Special Committee on Aging highlights the lack of transparency in Life Cycle funds. Senator Herb Kohl from Wisconsin, the key point person on the Senate's Special Committee on Aging, is investigating the asset allocation, expenses, management, and performance disclosures of Life Cycle funds for potential problems. (*Fortune*, June 14, 2010, p. 106).
3. Investment Company Institute 2011 Factbook: http://www.ici.org/pdf/2011_factbook.pdf.
4. FactSet as of May 2010.
5. "Morningstar Target-Date SEries Research Paper: 2010 Industry SUrvey," http://corporate.morningstar.com/us/documents/MethodologyDocuments/MethodologyPapers/TargetDateFundSurvey_2010.pdf.
6. Sandhya (2010) shows that of 162 Life Cycle funds that used other funds as their investment vehicle in 2008, 131 used the funds of their own fund family.
7. Sandhya (2010) shows Balanced Funds holding approximately 38% of their allocation in bonds on average from 2003 through 2008. Based on data from FactSet the three largest Life Cycle fund families (Vanguard, T. Rowe Price, and Fidelity) had an average of 48% invested in bonds for the 2010 target date (ranging from 42% to 52%), and 32% invested in bonds for the 2020 target date (ranging from 25% to 37%).
8. FactSet as of May 2010.
9. Dow Jones Target Date Indexes^{sm} Methodology. (http://www.djindexes.com/literature/).
10. S&P Target Date Index Series Methodology, July 2010. (http://www.standardandpoors.com/indices/sp-target-date/en/us/?indexId=sp-target-date).
11. Morningstar Lifetime Allocation Indexes, 2008. (http://global.morningstar.com/us/documents/Indexes/INS_INX_LifetimeAllocationFactsheet.pdf).
12. The median retirement age in the United States is approximately 62. Employee Benefit Research Institute Issue Brief, March 2010. (http://www.ebri.org/pdf/briefspdf/EBRI_IB_03-2010_No340_RCS.pdf).
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