NORTHERN TRUST

MAKING A CASE FOR FACTOR-BASED INVESTING IN TARGET DATE FUNDS

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Target date funds (TDFs) are the primary default investment option for many U.S. retirement plans. Sponsors can choose off-the-shelf or custom TDFs suitable for their plan participants. The underlying constituents can be asset managers' propriety funds. Alternatively, sponsors can establish an open architecture for their TDFs and swap in more efficient fulfillments, such as factor-based strategies, in the pursuit of enhanced alignment of risks and returns with retirement goals. The overall lower prospect of returns may well urge savers to take advantage of such factor tilts in their retirement vehicles to potentially improve outcomes.

RETIREMENT DISCOVERIES

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OPEN ARCHITECTURE

Under open architecture, sponsors have the flexibility to select and combine managers and strategies to fulfill one or all of the options on the investment menu. Sponsors have the duty to carefully vet managers, as always, but can consolidate managers, replace non-performing funds, or introduce new products efficiently when they become available in the market.

It also streamlines the review process as the managers being vetted in the target date fund are often the same within the core offerings. Open architecture provides plan sponsors with the ability to make changes as needed efficiently across the plan lineup. The Department of Labor's guidance suggests that sponsors need to select funds carefully and monitor them and address fiduciary risks on a regular basis.[1]

This open structure is beneficial to participants too as it provides less disruption, should a change in the underlying fund managers need to occur.

[1] U.S. Department of Labor, "Target Date Retirement Funds - Tips for ERISA Plan Fiduciaries," 2013.

FACTOR-BASED STRATEGIES

Defined Contribution (DC) plans are considering factor-based strategies as a more effective way to generate return and manage volatility. In some cases, factor-based strategies can replace index funds and in other cases they may be used as a complement to, or in place of an active manager to provide specific factor tilts (exposure) and bring the cost down.

In custom TDFs, factor-based equity strategies can play a bigger role in a glidepath designed to provide risk and return profiles that better align with participants' objectives. For instance, Quality Value seeks high quality companies that are priced below their fundamental value but are expected to be successful over the long haul. Quality Low Volatility seeks returns on stocks with consistently lower volatility (or lower beta correlation with the broad market) without giving up on the upside potential. Quality Small Cap tilts towards smaller companies with strong growth prospects, while avoiding those with low quality characteristics. Like other components in TDFs, the allocations to these factor strategies are calibrated based on their potential performance cycles and are set compatible with participants' investment horizons.[2]

Let's look at two DC plans to illustrate how factor-based strategies could be utilized in an open-architecture TDF to potentially improve the retirement readiness.

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PUBLIC SECTOR 457(B) PLAN

This 457(b) plan has characteristics (summarized in Figure 1) that are common among plans not qualified under the Employee Retirement Income Security Act. Reflecting the plan's provisions and demographics, our proprietary retirement planning framework suggests that a typical participant, whose starting salary is assumed to be similar to the national average, can aim to accumulate enough wealth at age 65 to replace 77% of her pre-retirement earnings.[3]

FIGURE 1: SUMMARY CHARACTERSTICS OF A PUBLIC SECTOR 457(B) PLAN

Starting Pay	$45,000 at age 25
Pay Raise	0.25% on top of inflation (2.5%)
457(b) Provisions	Non-ERISA qualified; no employer match
Target Replacement Rate (% of pre-retirement pay)	35% from 457(b), 42% from Social Security, 77% total

SOURCE: Illustrations by Northern Trust Retirement Solutions.

A series of TDFs is offered as the default investment option in this plan. The underlying components for the TDF glidepath are listed in Figure 2.

2 See more discussions in "Factor Investing: Not Which, But When," Northern Trust.
3 See details of our framework in "How Much Retirement Savings Is Enough?" by Gaobo Pang, Northern Trust.

FIGURE 2: CURRENT TDF & POTENTIAL ENHANCEMENTS FOR A PUBLIC SECTOR PLAN

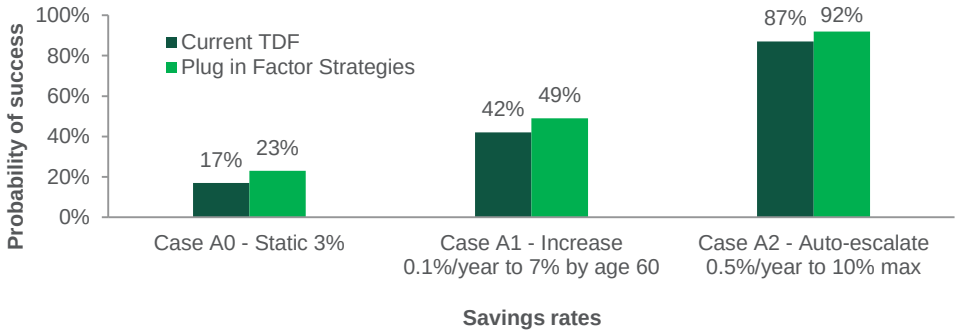
CURRENT TDF COMPONENTS	POTENTIAL ENHANCEMENTS
Large Cap Mid Cap Small Cap International Equity	Quality Value Quality Low Volatility Quality Small Cap
Money Market Bond Fund TIPS Commodities Global REIT	No Changes

SOURCE: Illustrations by Northern Trust Retirement Solutions

The sponsor has the desire to boost savings and make the plan the primary source for retirement over time. Currently the median participant contribution rate is 3%.

For workers with this static contribution rate, there is a meager likelihood (17% for Case A0 in Figure 3) that their plan assets will meet the required target replacement rate. The probability is calculated based on the TDF asset allocations and simulated returns. If participants increase their savings gradually and reach 7% in their 60s (as observed among some participants), they have a better chance of reaching the income target (42% for Case A1). However, the plan does not have an auto-escalation feature to generate positive inertia for higher contributions. Hypothetically suppose it did — an escalation of savings by a gentle 0.5% per year until the participant reaches a contribution rate of 10% of pay — then the chance of success would be substantially elevated (87% for Case A2).

FIGURE 3: POTENTIAL IMPROVEMENTS BY FACTOR-BASED STRATEGIES FOR A PUBLIC SECTOR PLAN



SOURCE: Illustrations and simulations by Northern Trust Retirement Solutions. The simulations reflect forward-looking capital market assumptions for the underlying funds and risk-return characteristics of factor-based strategies that are estimated based on historical data. The results are for discussion only and do not constitute investment advice. See further disclosure on the final page.

How could factor-based equity strategies potentially help? Those large-, mid- and small-cap U.S. funds and international equity funds could be substituted with an appropriate allocation to Quality Value, Quality Low Volatility, and Quality Small Cap global equity funds (Figure 2), dependent on the time to retirement. These funds consider the broad indices, but tilt the exposure to those factors that have potential

to generate attractive risk-adjusted returns and are utilized at specific points along a glidepath. The fees are somewhat higher than purely passive index funds but significantly lower than active options. For discussions here, it is assumed all other component allocations remain unchanged in the TDF series.

The move from passive index to factor-based equities improves the success probability for the workers considered by 6%, 7%, and 5%, respectively (for cases A0-2 in Figure 3 in comparison to the outcomes of current TDF). The help from investing builds upon rigorous and persistent savings, which is the financial foundation for retirement.

Empirically, factor-based strategies have historically generated greater absolute and risk-adjusted returns relative to standard indices over the long-term (Figure A1 in the Appendix). In addition, combining multiple factors, particularly the Quality factor, could potentially dampen the downward effects of cycles and increase returns (Figure A2). We have modeled the expected risk and returns of the factor-based strategies in the examples. Based on our simulated analysis, an improvement in outcomes is a possibility.

A PRIVATE SECTOR 401(K) PLAN

Let's also look at a 401(k) plan in the private sector, with a brief summary of plan characteristics in Figure 4. Our retirement planning framework suggests that the typical worker should aim to replace 43% of her pre-retirement earnings through this 401(k) plan, plus 36% from Social Security. This worker has a higher earnings profile, which means a lower proportion of future income to be delivered from Social Security and a greater private responsibility for retirement, compared with the worker in the public sector.

FIGURE 4: SUMMARY CHARACTERSTICS OF A PRIVATE SECTOR 401(K) PLAN

Starting Pay	$45,000 at age 25
Pay Raise	3.5% until age 55, 3.0% until retirement
401(k) Provisions	50% employer match, up to 6% of pay
Target Replacement Rate (% of pre-retirement pay)	43% from 401(k), 36% from Social Security, 79% total

SOURCE: Illustrations by Northern Trust Retirement Solutions.

The plan provides a TDF series to participants. The fund components are listed in Figure 5. Factor-based enhancements could be introduced as substitutes for the US and non-US index equity funds.

The help from investing builds upon rigorous and persistent savings.

FIGURE 5: CURRENT TDF & POTENTIAL ENHANCEMENTS FOR A PRIVATE SECTOR PLAN

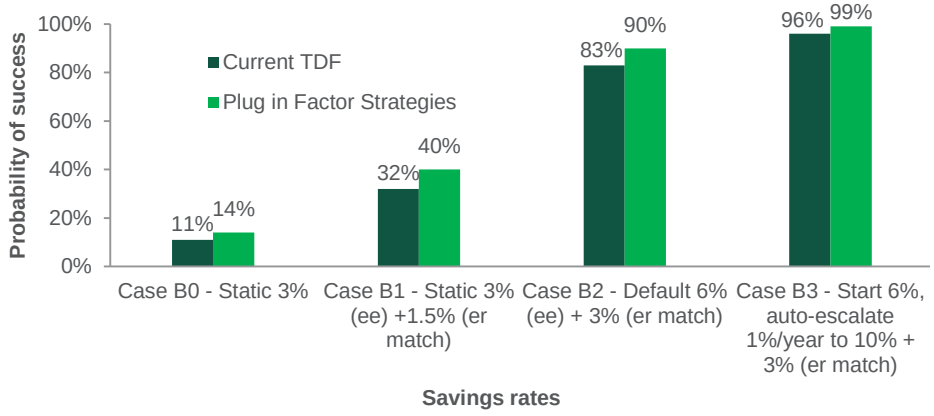
CURRENT TDF COMPONENTS	POTENTIAL ENHANCEMENTS
U.S. Equity Non U.S. Equity	Quality Value Quality Low Volatility Quality Small Cap
U.S. High Yield Global Real Estate Commodities U.S. TIPS 1-10 Year U.S. Aggregate Bond	No Changes

SOURCE: Illustrations by Northern Trust Retirement Solutions.

With employer match, the participants in this plan generally fare better. Specifically, a static 3% savings rate by employees means a low chance to meet their retirement income target (11% for Case B0, Figure 6), and the employer match increases the likelihood (32% for Case B1). The factor-based equity would further increase the likelihood (40%). If the contribution rate was set at 6% as default, thus maximizing employer match, the participants would likely meet their target with a good chance (83% for Case B2). Compared to the current TDFs, factor-based equity strategies could still provide a solid boost (to 90% chance of success).

The enhancement was less impactful in Case B0 because those participants stuck with a low level of savings. The impact is also a small percentage for those with the highest level of savings (Case B3), for a different reason – far from discouraging, this simply reflects the high success probability these workers already enjoy, and the improvement is still significant in dollars.

FIGURE 6: POTENTIAL IMPROVEMENTS BY FACTOR-BASED STRATEGIES FOR A PRIVATE SECTOR PLAN



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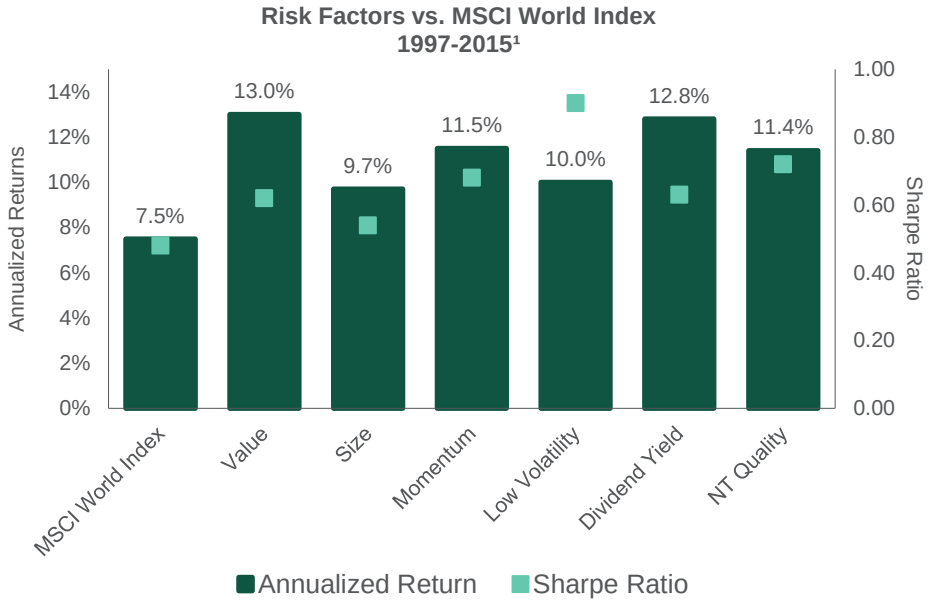
Integrating reputable factor strategies into open-architecture TDFs empowers participants to accumulate assets.

CONCLUSION

Open architecture is being used to combine managers and strategies in target date funds. Factor-based equity strategies utilize a rigorous quantitative process to select securities that meet the plan participants' objectives and filter out those unwanted exposures. Integrating reputable factor strategies into open-architecture TDFs empowers participants to accumulate assets, improves the long-term outlook for young savers, and reduces the risk exposure for those near or in retirement. These strategies set well in alignment with plan participants' investment horizons and may help achieve a greater likelihood of readiness for retirement.

APPENDIX

FIGURE A1. HISTORICAL PERFORMANCE OF FACTOR-BASED STRATEGIES VS. INDEX



Notes: Factor returns are defined as the equally weighted top or bottom 20% of the MSCI World Index. Ranking is based on exposure to factor as defined by Barra (Value, Momentum, Volatility, Dividend Yield, Size) and Northern Trust Quality Score. Factors are winsorized to remove extreme 5% of outliers.
¹Returns represented from 1/31/1997 reflects the availability of GEM2 risk model data
Past performance is no guarantee of future results. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index.
Source: Northern Trust Quantitative Research, data as of 12/31/2015

FIGURE A2: BENEFITS OF MULTI-FACTOR PORTFOLIO CONSTRUCTION (ANNUALIZED RETURN %)

Period	Value	Low Volatility	Quality & Value	Quality & Low Vol
1979 to 1982	1.9%	0.6%	11.2%	4.6%
1983 to 1986	13.0%	29.5%	25.9%	29.4%
1987 to 1990	-2.5%	26.1%	12.4%	27.3%
1991 to 1994	9.6%	-2.1%	15.7%	5.9%
1995 to 1998	1.5%	13.6%	9.7%	15.7%
1999 to 2002	15.3%	22.6%	35.9%	27.1%
2003 to 2006	10.1%	-5.6%	14.3%	-0.5%
2007 to 2010	5.7%	-9.9%	9.5%	-2.9%
2011 to 2015	-4.7%	14.3%	0.7%	11.7%

Notes: Past performance is no guarantee of future results. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index.
Source: Northern Trust Quantitative Research

NORTHERN TRUST RETIREMENT SOLUTIONS

As one of the largest managers of DC assets in the United States, our team has deep expertise in developing innovative answers to challenges faced by many of the world's largest DC plan sponsors. Collectively, these sponsors have entrusted us to manage more than $138 billion and to provide custody and administrative services for more than $358 billion in DC assets as of March 31, 2017. We take a consultative approach to addressing the needs of plan sponsors and participants while offering a suite of solutions – including an inflation-sensitive asset fund and target date funds – aimed at improving retirement outcomes.

Contact us

To learn more about Retirement Solutions at Northern Trust, contact us at DC_Solutions@ntrs.com.