Life-cycle Finance and the Dimensional Managed DC® Solution

By Wade Pfau
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Pension plans are like cars, according to Nobel laureate Robert Merton. People want a car they can drive and a pension that will maintain their standard of living in retirement; they do not care about what goes on under the hood.

Advisors, however, must care. So when a new pension-like option hits the market, as Dimensional Retirement's Dimensional Managed DC® recently did, it's important to go beyond simply kicking the tires and carefully examine how it works as a retirement- saving vehicle.

In March, I heard the CEO of Dimensional Retirement (an affiliate of DFA), present the concept of the Dimensional Managed DC® at the RIIA Spring Conference in Chicago. DFA's objective is to provide retirement income solutions based on life-cycle finance theory, as developed by Merton (and fellow Nobel Prize winner Paul Samuelson). I'll review life-cycle finance and how it differs from traditional modern portfolio theory, then explain Dimensional Retirement's new offering and how I believe it will help investors.

Life-cycle finance

The Dimensional Managed DC® defined-contribution managed account solution is essentially an implementation of life-cycle finance theory, and understanding their approach must begin with a grasp of the theory's key concepts.

Milwaukee-based financial planner Paula Hogan is among those who have documented the emergence of life-cycle thinking. In a May 2007 *Journal of Financial Planning* article, Life-Cycle Investing is Rolling Our Way, Hogan urged planners to get up to speed on life-cycle finance – or risk being left behind. She described how developments in life-cycle investing theory in the 1970s, coupled with innovations in derivative markets, set the stage for the emergence of a new "dominant paradigm" in 1990s institutional finance. Those changes, she argued, had begun shifting to the personal finance retail market.

For those interested in a more extended discussion of the theory than I provide below, Hogan's article and a similar introductory article by Boston University professor Zvi Bodie in the January/February 2003 issue of *Financial Analysts Journal* both articulate the nuts and bolts of life-cycle finance theory very well.

Life-cycle finance developed as a more general case of modern portfolio theory (MPT) which can be applied to households. With MPT, investors aim to maximize wealth by seeking the highest possible returns given their capacity and tolerance for risk. They find a satisfactory point on the efficient frontier of suitable investments based on single-period

asset class expected returns and standard deviations, which are generally estimated from historical data. For retirement planning, spending and asset allocation recommendations are based on historical or Monte Carlo simulations of failure rates, to mitigate the risk of wealth depletion that is inherent in drawing down a portfolio of volatile assets.

Practitioners of MPT manage risk with precautionary savings and portfolio diversification. But the traditional view of risk, which defines it as portfolio volatility, may not be closely linked to the real risk of falling short of a desired income level. Changing interest rates, for example, may affect the cost of future spending in ways unrelated to changes in wealth.

With life-cycle finance, the objective is to smooth the spending and leisure one can enjoy over his or her lifetime. Adherents take a long view beyond a narrow focus on retirement alone and employ additional risk management techniques, including hedging and insuring. Life insurance, pensions, bond ladders, fixed- and deferred-income annuities, and delayed retirement are all part of the life-cycle planning toolbox. With the shift away from a single-period focus, the goal becomes clearer as to how one can most efficiently target a retirement spending goal.

The emphasis is on treating future retirement spending as liabilities, which should be matched with appropriate assets. For basic spending needs, Social Security, bond ladders, and fixed annuities should take the lead, while other, more discretionary expenses may be funded with more volatile (and hopefully higher-returning) financial assets. The traditional planning concept of a safe withdrawal rate from a volatile portfolio is inappropriate in this context. Failure should not be an option when meeting basic needs.

Relying on the term structure of interest rates and the information contained within the prices of financial derivatives, it is possible to financially engineer a smooth match to spending needs, even those that may still fall in the distant future. Dynamic asset allocation – with adjustments to ensure that at any given time savers are only taking as much risk as is necessary to reach their goals – is important, as financial variables constantly fluctuate.

With life-cycle finance, a significant focus when determining asset allocation strategies falls on human capital, defined as the discounted present value of one's income over their working lifetime, or at least the portion of it to be saved. The title of Moshe Milevsky's book, *Are You a Stock or a Bond?*, encapsulates this mindset nicely.

The question matters because, for example, tenured professors with safe and steady income may take more risk with their financial assets, while those whose income is already tied to the vagaries of the stock market may find it more appropriate to emphasize bonds in their financial portfolio. Younger individuals will tend to have more human capital and more flexibility to work longer or save more as a hedge against portfolio losses, which justifies more aggressive asset allocation strategies when goals are more distant.

In applying life-cycle finance, Merton and others have pushed for simple solutions for defined-contribution plan participants to obtain retirement income without having to worry about the complexity of how to most efficiently invest. This is what Dimensional Retirement now seeks to do.

Dimensional Managed DC®

The Dimensional Managed DC'® is a solution for defined-contribution plans. Dimensional seeks to create participant outcomes similar to traditional defined-benefit pensions.

Dimensional Managed DC's® goal is to help each participant afford an inflation-adjusted immediate annuity at retirement that can, provide their desired amount of spending power when supplemented by their projected social security benefits and other defined benefits.

The income that the Dimensional Managed DC® targets depends on current wealth and projected future savings within the managed account, and on the prices of hypothetical inflation-adjusted deferred annuity units. Projections for annuity prices depend on interest rates, the inflation outlook and mortality statistics. Their prices can be quite volatile, and nothing is
guaranteed with respect to what will actually be on the market when the desired retirement date arrives. But fixed-income holdings are adjusted so that the duration of the assets matches the duration of the annuity's liability payments. Assets and liabilities are correlated as interest rates change, minimizing the fluctuations in the projected guaranteed lifetime income stream.

Dimensional Retirement managers use a dynamic asset allocation strategy, with three underlying funds of funds: a broad-based stock fund with total-world exposure, a medium-term inflation linked fixed-income fund, and a long-term inflation-linked fixed-income fund. Asset allocation adjusts monthly depending on where a participant falls with respect to his or her spending goals.

The first slice of the portfolio aims to meet the minimal spending goal, with at least 96% estimated probability. The rest of the portfolio seeks to increase the estimated probability of meeting the desired income goal. This allocation takes into account factors such as the time to retirement and the nature of income growth and volatility in the participant's employment sector – the human capital element identified earlier. Dimensional Retirement customizes its human capital projections for each participant, based on detailed cross-sectional data for American workers.

Participants can modify their outcomes by deciding to save more, retire later, or revise spending goals downward. Indeed, asset allocation decisions are first guided by the participant's input, including his or her intended retirement date, the projected amount of new contributions to be made each year, a minimal acceptable income goal during

retirement, and a reasonable desired spending level that serves as the primary goal. Built-in feedback, in the form of an estimated probability meter that the participant will reach its desired spending goal, given the assets in the account, projected social security benefits and other defined benefits, is meant to guide the planning process toward a set of consistent, realistic decisions about saving and spending.

Especially while retirement remains distant, projecting future salaries, savings ability, spending needs and major life events – marriage or divorce, for instance – may be difficult. Participants should update plans from time to time, but otherwise the plan does prepare default assumptions for disinterested participants.

Though young participants may not be able to duration-match their long-term liabilities, their plans can be refined as retirement approaches. Dimensional Retirement's focus on projecting retirement income to meet specific goals allows a wide variety of participants to easily understand their projected retirement income and the assumptions that underlie it, as well as the implications of altering those assumptions.

For participants in the Dimensional Managed DC®, all 401(k) assets must be invested. Participation costs in the neighborhood of 30 basis points for the advisory fee and 40 basis points for the net expense ratio of the underlying mutual funds.

The bottom line

Is it wise at the societal level to shift pensions from defined-benefit to defined-contribution, when it is clear that many individuals lack the interest or ability to master the basics of investing? Perhaps not, though life-cycle proponents are seeking ways to bring the benefits of defined-benefit pensions into a defined-contribution world without unduly burdening employers.

Dimensional Managed DC® exemplifies this trend. Participants will learn that building a retirement income floor is expensive, particularly in a low interest rate environment, but showing the link between one's current situation and his or her projected lifetime income will prove valuable in motivating more focus on retirement.

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