Article from

Retirement Section News

September 2019

Issue 99

An Exploration of Lifecycle Finance

By Matthew Brady

Many retirement actuaries have experience developing, implementing, and monitoring liability driven investing (LDI) strategies for plan sponsors. These strategies typically involve modifying a plan's investment strategy to remove a significant portion of the investment and interest rate risk now or at some point in the future when specific triggers are met. The tactics often involve the use of fixed income assets to cash flow and/or duration match the liabilities.

In the spirit of helping actuaries expand their roles in an evolving defined contribution world, this article explores the application of LDI and de-risking strategies within defined contribution and individual retirement accounts.

The economic theory behind this approach is called the lifecycle hypothesis, or lifecycle finance. Developed in the 1950s by Nobel laureate Franco Modigliani and extended later by many economists including Paul Samuelson, Robert Merton, and Zvi Bodie, the lifecycle hypothesis assumes that individuals value smooth consumption over their lifetimes and try to avoid abrupt changes in consumption. You purchase disability insurance to avoid losing your primary income source upon illness or injury. You purchase life insurance to provide an income stream for your family in the event of an untimely death. You save for retirement to provide a safe and reliable source of income to fund your expenses after you leave the labor force.

There are myriad approaches for saving and investing for retirement, but only one—the lifecycle finance strategy—focuses on securing a safe income floor in retirement. Coincidentally, this is achieved using methods familiar to retirement actuaries.

Zvi Bodie lays out this strategy in his book *Worry-Free Investing*.[1]

1. **Set goals—**identify how much you can save for retirement, when you might want to (or need to) retire, and how much income (*not wealth*) you will need in retirement. You should be realistic about your retirement age and plan for a range of years, rather than a specific year. Remember, most retirees end up retiring earlier than planned.[2]

2. **Specify targets—**determine the minimum amount of income you will need in retirement to fund living expenses (e.g., food, clothing, shelter, and health insurance); the amount of retirement income you will receive from Social Security, pensions, and annuities; the amount of income you will need in addition to Social Security, pension, and annuities (the retirement income floor); and the type of investments that you will use to fund the retirement income floor. Bodie suggests Treasury Inflation Protected Securities (TIPS) and Inflation Linked Bonds (I Bonds) as the safe and reliable way to accumulate and fund this retirement income floor. In today's low rate environment, it will be expensive to secure the minimum income necessary to meet living expenses, but delaying Social Security may significantly reduce the cost of the retirement income floor.

3. **Compute your required no-risk savings rate—**determine how much you would need to save annually in TIPS and/or I Bonds in order to fund the retirement income floor. In today's low rate environment, individuals will likely need to save more and/or work longer to fund their retirement.

4. **Determine your tolerance for risk—**if you have a high savings rate and/or are flexible on when you would like to

retire, then you have more capacity for risk and risky assets (e.g., equities). The common perception is that young people have a long time for equities to generate excess returns over safe investments, but the lifecycle theory implies that capacity for risk, not time, should determine asset allocation.

5. **Choose your risky asset portfolio—**once you have allocated enough to safe investments (e.g., TIPS and I Bonds) to cover the retirement income floor, then you can determine how much of the rest of the portfolio to allocate toward equities and other risky investments.

In the prior issue of *Retirement Section News*, Anna Rappaport called attention to the four biggest risks that individuals face in retirement: investment risk, interest rate risk, inflation risk, and longevity risk.[3] Lifecyle finance is intended to mitigate all four risks.

Investment risk is mitigated by using TIPS and I Bonds, which are backed by the U.S. Treasury, to fund a safe stream of retirement income. Investment risk is only present within the portion of the portfolio that will be used to fund discretionary expenses and even that may be subsequently used to increase the level of the retirement income floor.

Interest rate risk is mitigated by using individual TIPS securities, TIPS funds/ETFs, and I Bonds to cash flow or duration match the retirement income floor. If rates rise, then the value of the safe assets will decrease but so will the value of the liability (the retirement income floor). Similarly, if rates decrease, then the value of the safe assets will increase, as will the value of the liability. There are a variety of short, intermediate, and long-term TIPS funds available to allow individuals to easily duration match their liabilities while still holding liquid securities.

The lifecycle finance method is a sound economic and financial theory for individuals to save for retirement, but it cannot be implemented if individuals have little or no retirement savings.

Inflation risk is mitigated due to the fact that TIPS and I Bonds are indexed to inflation, as measured by the Consumer Price Index (CPI). If inflation unexpectedly increases, then TIPS and I Bonds will compensate by delivering an income floor that similarly rises to match new price levels.

Last, longevity risk can be mitigated by purchasing an annuity—specifically a Single Premium Immediate Annuity (SPIA), Deferred Income Annuity, or a Qualified Longevity Annuity Contract (QLAC)—to provide guaranteed income over the individual's lifetime. In fact, if the portfolio of TIPS and I Bonds are cash flow or duration matched to the retirement income floor, then abrupt changes in interest rates near retirement will not have a material impact on the individual's ability to purchase an annuity.

While this approach mitigates all four risks, some may be concerned that it would be prohibitively expensive, especially compared with other retirement withdrawal strategies. Table 1 illustrates the cost to provide a $40,000 income using a TIPS portfolio duration matched to provide 30 years of retirement income and a CPI-adjusted SPIA. Both approaches provide an initial withdrawal rate just slightly below the "4 percent Rule" while providing secure inflation-adjusted income for life in retirement.

Table 1
Cost to Provide a $40,000 Income

	Beginning Annual Income	Balance Needed at Age 65	Withdrawal Rate
TIPS Ladder*	$40,000	$1,074,535	3.6%
CPI-Adjusted SPIA**	$40,000	$1,102,109	3.7%

* Derived by author using Daily Treasury Yield Curve Rates as of May 17, 2019. Source: *https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=realyield*

** Based on a couple age 65 living in Texas who purchase a 100% joint and survivor annuity as of May 17, 2019. Source: *www.BlueprintIncome.com*

The challenge with annuities is that many issuers do not offer inflation adjusted SPIAs. Additionally, in the last issue of *Retirement Section News*, Mary Hardy described findings from a recent research study by the Canadian Institute of Actuaries (CIA) that showed an alarming number of retirees do not like annuities: "When given a hypothetical amount of money available to them at their hypothetical retirement, 84 percent would not pay even half of the market price for a life annuity, and most wouldn't buy one at any price." [4]

The CIA survey highlights another significant challenge with retirement planning for society—61 percent of respondents had little property wealth and savings (less than $200,000 for single respondents and $300,000 for married/common law respondents).[5] The lifecycle finance method is a sound economic and financial theory for individuals to save for retirement, but it cannot be implemented if individuals have little or no retirement savings. For these individuals, implementing the lifecycle finance strategy while delaying Social Security by continuing to

work and using home equity to generate retirement income via a reverse mortgage may be the best options on the table.

Indeed by delaying Social Security, individuals may find that most, or even all, of their living expenses are covered by Social Security, and safe investments are only needed to cover living expenses from retirement until Social Security begins. This approach might closely resemble Steve Vernon's "Spend Safely in Retirement" strategy.[6]

The benefits of the lifecycle finance method are that it provides a safe approach to save for retirement and a secure source of floor income during retirement. Similar to pension plans, each individual has his or her own idiosyncratic needs, wants, and risks that should be considered. Actuaries are viewed as experts on the topic of LDI and de-risking strategies for pension plans. As a result, actuaries are uniquely situated to help defined contribution plan sponsors, individuals, and even themselves implement the lifecycle finance approach by developing and distributing tools and methods that focus on income (rather than wealth), LDI strategies, and personalization. ■

Matt Brady, FSA, is an actuary focused on helping individuals plan for retirement and improve their overall financial wellness. He can be contacted at *matthewtbrady@gmail.com.*

ENDNOTES

1 Bodie, Zvi. *Worry-Free Investing: A Sure Way to Achieve Your Lifetime Financial Goals*. Prentice Hall, 2008.

2 *Retirement Survey Report Key Findings and Issues: 2017 Risks and Process of Retirement Survey*. Society of Actuaries, 2017.

3 Rappaport, Anna M. "Perspectives From Anna: Evolution of Retirement and Risk-Sharing Ideas." *Retirement Section News*, Society of Actuaries, Feb. 2019.

4 Rappaport, Anna M. "Retirement Consumption, Risk Perception and Planning Objectives in Canada: An Interview with Mary Hardy." *Retirement Section News*, Society of Actuaries, Feb. 2019.

5 Hardy, Mary, et al. Retirement Consumption, Risk Perception and Planning Objectives. Canadian Institute of Actuaries, June 2018.

6 Vernon, Steve. "How to 'Pensionize' Any IRA or 401(k) Plan." Stanford Center for Longevity, Nov. 2017.