

LONGEVITY INSURANCE



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BUILDING A PORTFOLIO FOR LIFE

AUTHORS

David Patel
CAGR SQUARE

Joshua Zwick
Oliver Wyman

Randolph B. Cohen
Harvard Business School

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EXECUTIVE SUMMARY

When planning your financial future, what do you think about more: “When am I going to retire?” or “How long am I going to live?”

If you're like most people, you probably consider the former more than the latter. Why? First, you control when you retire, but your lifespan remains all too uncertain. Second, though many dream of retirement, few enjoy thinking about the inevitable end of life.

Investors and financial planners understandably focus on how to accumulate enough assets to savor the golden years. But planning only to retirement—rather than through retirement—can prevent seniors from truly enjoying their savings, force them to cut spending later in life, and increase the likelihood that they burden loved ones.

Planning to retirement was once sufficient. Few people lived longer than ten years without an earned income, and it wasn't hard to build a nest egg to last a decade. Outliving your assets wasn't high on the list of concerns. Even death wasn't the scariest thing, as Jerry Seinfeld wryly observed nearly thirty years ago:

“I saw a study that said speaking in front of a crowd is considered the number one fear of the average person . . . Number two was death. Death is number two? This means to the average person, if you have to be at a funeral, you would rather be in the casket than doing the eulogy!”

Times have changed, so while many still fear public speaking, running out of money has become a leading cause of anxiety.¹ Indeed, if asked today, Seinfeld might quip that someone would rather be in the casket than too poor to pay for burial.

Rapid improvement in health technology has driven most of this concern. We live in a golden age of life-extending innovations, where advanced treatments are allowing us to conquer the scourges that have plagued humankind for millennia. These advances won't merely enable our newborns to live well into their 70s, they will also permit those already at typical retirement ages to enjoy life into their 80s and 90s. A 65-year-old man has a 7% chance of achieving the century mark.

And that's just the average person with today's technology. Consider what this might look like in the future, especially for healthier people with better care. It isn't hard to imagine technological innovations dramatically lengthening lifespans, so that ages considered newsworthy today could become commonplace in the future. Though this is wonderful news for humanity, and we should all cheer the ground-breaking research and ingenuity of doctors and scientists, this increase in longevity has a downside: it means some retirees will outlive their savings. Sad to say, a majority of retirees fail to adequately consider this longevity risk in the construction of their retirement plans.

The decline of traditional sources of retirees' income adds to this longevity risk challenge. Most defined-benefit pensions have been closed or frozen in favor of defined-contribution schemes; Social Security is susceptible to policy changes, such as means testing; and macroeconomic headwinds make the investment

1 2017 Allianz “New Generations Ahead” Study.

returns of the past half-century hard to replicate. The result is a widening coverage gap between savings and retirement needs. Some will experience the worst-case outcome and run out of money completely. Many more will have to sharply curtail spending, accept a lower standard of living, or seek support from loved ones. Longevity risk means you might lose your freedom to live life on your own terms, fully confident in your ability to enjoy a dignified, stress-free retirement.

This paper illuminates a path towards ensuring this freedom by eliminating longevity risk. However, following the trail requires shifting your mindset from retirement planning to lifetime planning, from merely accumulating retirement assets to building a holistic plan that seeks to guarantee financial security and peace-of-mind *through* your life.

Just as doctors are using more sophisticated treatments to lengthen our lives, implementing the "through" mindset requires new and better financial tools. Financial plans constructed from traditional assets like equities and bonds are not designed to protect you against longevity risk.

Throughout this paper, we refer to this new class of tools as longevity insurance. (See Box Note 1 for a short explanation of longevity insurance.) The idea is far from new. For decades, pension funds and Social Security have given retirees income up until their date of death, but not beyond. You need a financial product that guarantees income for exactly that timespan. Though perhaps less impressive than lifesaving stem cell treatments, it can provide amazing improvements in terms of retirees' financial security and emotional well-being. Consider the benefits of longevity insurance:

- **It is the safe play:** Purchasing longevity insurance gives you comfort that long life won't lead to insolvency.
- **It allows for a more enjoyable and fulfilling lifestyle:** Longevity insurance allows you to fully enjoy retirement, by providing an income stream to support your lifestyle and cover expenses later in life.
- **It provides greater investment freedom:** Knowing that you are covered by longevity insurance empowers you to take advantage of riskier, higher expected returning investment opportunities rather than parking assets in low-yielding bonds. That means potentially more money for unexpected circumstances and a bigger bequest to loved ones.
- **It offers peace-of-mind:** Psychologists have shown that not having to worry about money increases happiness, reduces stress, and improves health and welfare. Anyone who has fretted about money knows how debilitating it is. Eliminating that concern has tremendous benefits and may, in fact, extend your life, making the longevity insurance policy an even better deal.
- **It is a gift to loved ones:** Most people recognize the need for having life insurance. They understand that a tragic event can leave their loved ones in difficult circumstances. Shouldn't a thoughtful person hedge against the possibility of living "too long"? By securing an income stream guaranteed by an insurance company, longevity insurance reduces the likelihood of becoming a financial burden to loved ones later in life and increases the certainty that one can leave them a substantial bequest.

Lifetimes are getting longer. Guaranteed income sources are dwindling. Investment returns are under pressure. It's the perfect storm. Just as we highlighted a path to achieving improved investment results in *Illuminating the Path Forward: Breaking Free from the 60/40*, this paper shines a new light that will help navigate through this storm as well. Extending our lives is one of humankind's greatest triumphs, but that remarkable progress can threaten our ability to experience the very benefits of our ingenuity. Longevity insurance is the financial innovation that can not only allow you to enjoy the fruits of your own labor but that of humanity as well.

BOX NOTE 1: WHAT IS LONGEVITY INSURANCE?

Longevity insurance provides an income stream guaranteed by an insurance company for a retiree's entire lifespan, starting from a pre-determined age.

Here is how it works:

1. The policyholder elects an income start date—e.g., at age 85;
2. The policyholder gives an insurer a lump sum premium payment;
3. When the income start date arrives, the policyholder receives a regular income payment each month, quarter, or year, guaranteed by the insurance company for life.

Relative to the premium payment, the size of each income payment is based on the age at which the policy is purchased and the date on which income starts. The longer the income payments are deferred, the larger the payment sizes.

LONGEVITY RISK: UNDERAPPRECIATED AND UNDERESTIMATED

Many people fear they will outlive their savings. In a recent poll, almost two-thirds of Americans feared running out of money in retirement more than death itself.² In a separate poll, two of the top three fears retirees expressed related to their sources of income—i.e., (i) reduction in Social Security, and (ii) outliving savings and investments.³ This anxiety itself impairs the experience of retirement, forcing people to contemplate downsizing, belt-tightening, or burdening family.

In reality, few people exhaust their assets entirely, but many are forced to cut their spending or seek the support of friends or loved ones. For those who saved for a comfortable, dignified, independent retirement, such outcomes are unacceptable, even tragic. Yet the confluence of several broad trends makes this calamity more likely.

TREND #1: IMPROVING HEALTH CARE AND INCREASING LIFE EXPECTANCIES

How long do you plan on living? Most people assume healthcare advances will allow them to live longer than their parents but otherwise haven't thought about it much. For example, in a poll of American retirees, 43% of respondents said they had no idea how long they would live.⁴ And while the life expectancy of the average person is easily predicted, correctly estimating a specific individual's lifespan is substantially more challenging. Moreover, if retirees struggle to predict their lifespan, then they will find it difficult to estimate their probability of living five, ten, or fifteen years beyond predictions, **which has huge consequences for longevity risk.**

² 2017 Allianz "New Generations Ahead" Study.

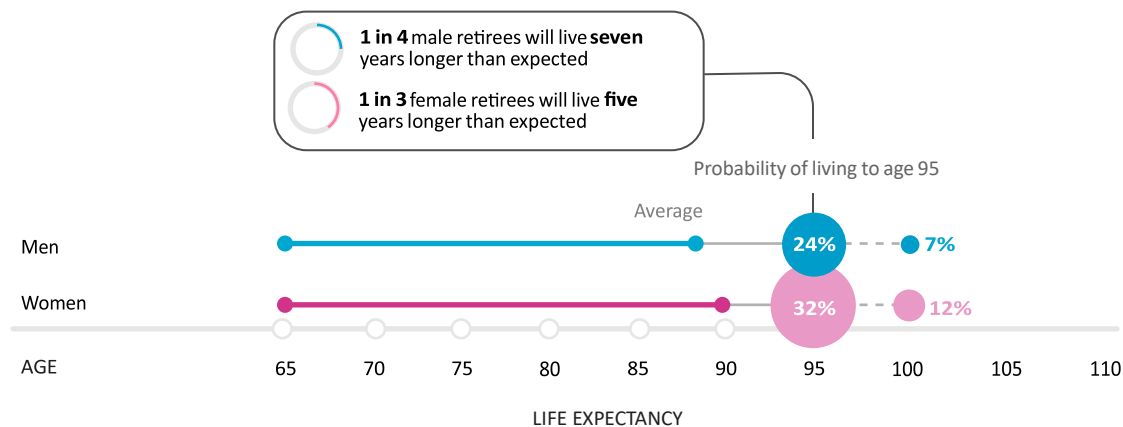
³ Transamerica Center for Retirement Studies.

⁴ Transamerica Center for Retirement Studies.

Indeed, the probability of living substantially longer than expected may be quite a bit higher than some retirees expect, as illustrated in Figure 1:

- While a 65-year-old male investor has a life expectancy of just under 88, he has a 24% probability of living until 95 and 7% probability of surviving to 100;
- While a 65-year-old female investor has a life expectancy of 90, she has a 32% probability of living until 95 and 12% probability of surviving to 100.

Figure 1: Probability of survival for a 65-year-old retiree



Living beyond life expectancy has serious financial implications. For instance, simply living for an additional ten years translates to roughly \$800,000 of expenses if annual withdrawals equal \$80,000, or 4% annually assuming a starting \$2MM portfolio.⁵

Though a retiree who outlives expectations can reduce expenses, many costs are unavoidable. For instance, Fidelity estimates that a 65-year-old couple, retiring in 2015 and living 20 and 22 additional years, respectively, will accrue added healthcare costs of \$280,000.⁶ Should either retiree significantly outlive expectations, these expenses will quickly consume more of their budget, further depleting their assets.

Wealthier people, in particular, are especially living longer. One benefit of prosperity is improved health, as it allows people to afford better health care and is associated with lower rates of smoking, obesity, and stress.⁷ Wealthier individuals experience higher life expectancies, as we illustrate in Figure 2.

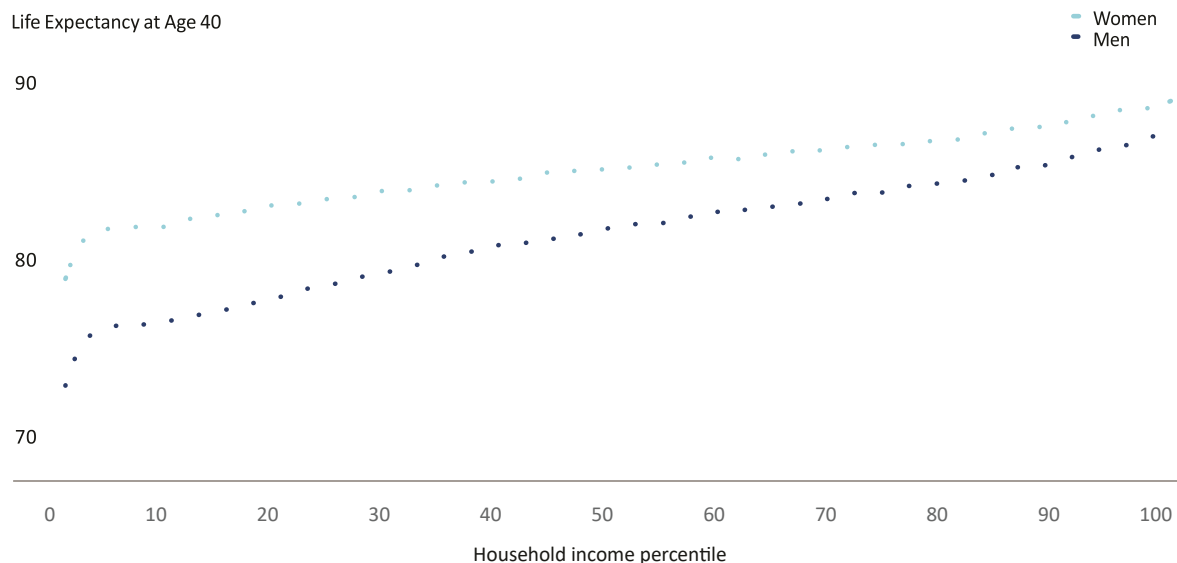
⁵ To align with typical financial planning conventions, we have used \$80,000 as an estimate for annual expenditures in retirement throughout this paper, which also corresponds to a 4% annual withdrawal rate for an investor with \$2 million in investible assets upon entering retirement. However, four percent may be too low when considering the recent study, "Spending in retirement: The final frontier," by Retirement Insights, J.P. Morgan Asset Management. The study indicates that the annual average spending in 2015 is \$111,073 for age 85+ retirees with \$500,000 to \$1 million in investible

assets. Younger retirees with \$500,000 to \$1 million in investible assets, or age 85+ retirees with more investible assets, have even higher annual average spending amounts.

6 2015 Fidelity analysis performed by its Benefit Consulting group. Estimate has been updated for 2018.

7 Chetty R, et al. "The Association Between Income and Life Expectancy in the United States," 2001–2014. JAMA.

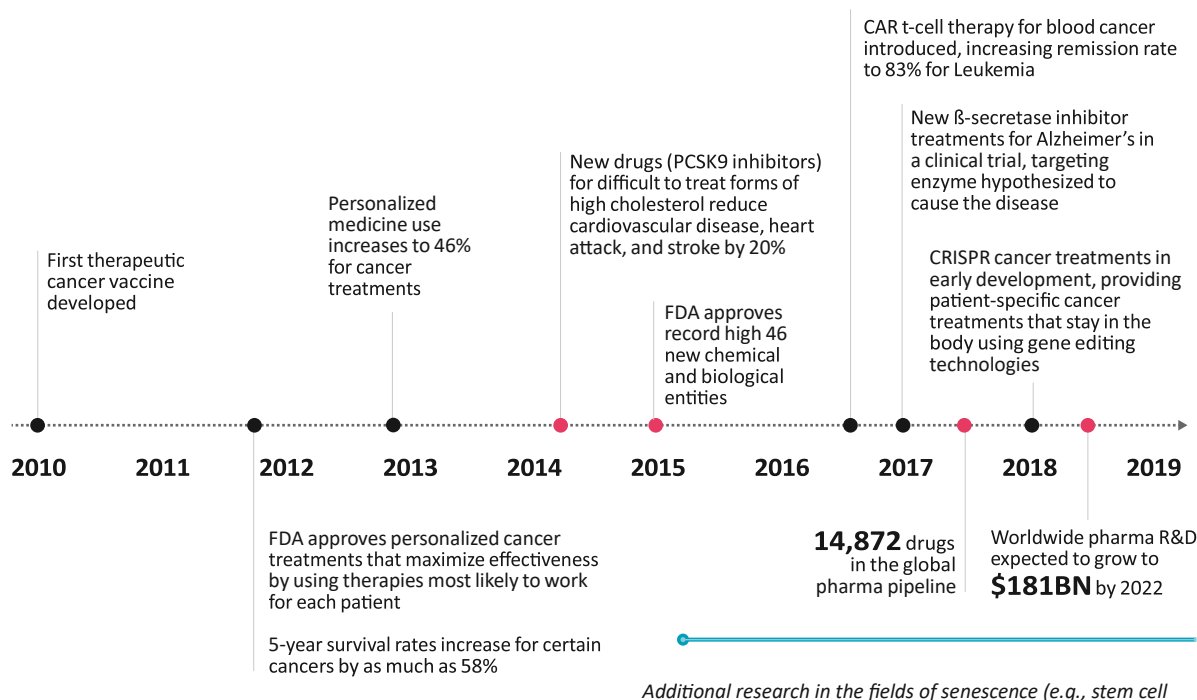
Figure 2: Life expectancy by income percentile



Source: Health Inequality Project

Lastly, the march of technological progress in medical and life sciences shows no sign of slowing; indeed, it seems to be accelerating, as highlighted in Figure 3.

Figure 3: Advances in life sciences may change expectations for longevity



- Disease Treatment therapies) has the potential to change aging as we know it, both R&D Discovery extending longevity and
- improving quality of life in old age

Sources: *Cancer Medicines: Value in Context*. 2017. PhRMA, *Biopharmaceuticals in Perspective*. 2017. PhRMA.

While living forever may be impossible, recent advancements in life sciences—such as gene editing and stem cell research—may accelerate improvements in longevity. In just the past few years, physicians have made strides in addressing the leading causes of death among seniors—e.g., heart disease, cancer, stroke, and Alzheimer’s disease. These breakthroughs may enable new classes of medications and medical treatments. Indeed, the research and development budgets for the life sciences industry keep growing, as do the number of drugs in every stage of the pipeline. Future scientists may even tackle aging itself, as biologists better understand the cellular biology of aging (i.e., senescence).

As we celebrate this progress and cheer for further improvements, we must recognize how this affects our saving, spending, and investment decisions. Placing this in the broader societal and financial context only highlights the need for a new approach.

TREND #2: SOCIETAL SHIFTS AND THE EROSION OF GUARANTEED INCOME SOURCES

Retirees historically reduced uncertainty by obtaining both guaranteed and non-guaranteed sources of income. Defined benefit pension plans and Social Security provided a certain level of lifetime income. And an investment portfolio, producing indeterminate returns, paid the remaining expenses.

Yet the traditional sources of guaranteed lifetime income are unfortunately disappearing:

1. Corporations have largely replaced defined benefit plans with defined contribution plans, where the employee, rather than the corporate plan sponsor, has both the longevity risk and the investment risk. Defined contribution plans have the same prospects and hazards as the remainder of the retiree’s investment portfolio (and they have no explicit protection against longevity risk);
2. Policymakers may reform Social Security, perhaps limiting benefits to less affluent Americans. Some retirees may learn that income they thought was guaranteed is actually uncertain.

We are suggesting neither that Social Security will entirely disappear, nor that corporations will completely renege on promised pension benefits. But the bedrock of retirement funding for the last 50 years or so is eroding. When making decisions with long-lasting implications, those entering the critical 10 to 15-year window prior to retirement should note the decline of guaranteed income sources.

TREND #3: FINANCIAL MARKETS AND SHRINKING FUTURE RETURNS

As sources of guaranteed income disappear, retirees must rely on non-guaranteed income to fund their expenses. Under the old mindset, investors saved during their working lives, and cashed in those assets over their golden years, hoping they wouldn’t outlive their reserves. To balance capital preservation and growth potential, they accumulated a portfolio combining “safe” assets, such as bonds, and “risky” assets, such as stocks. But as we discussed in *Illuminating the Path Forward: Breaking Free from the 60/40*, past investors benefited from:

1. A falling or stable interest rate environment, which supported a 30-year bond bull market;
2. A steady and relatively low-volatility recovery in equities following the financial crisis.

The structural forces helping past retirees are unlikely to persist. Interest rates are at or near historical lows, and any increase will shrink the value of bond allocations, acting as a headwind for all traditional asset classes. Recall that between 1964 and 1981, interest rates increased by over 10%, and excess returns of a 60/40 (returns above what you could have gotten in a bank account) were -1.4%. By contrast, interest rates have fallen by over 13% since their peak in 1981, creating ideal conditions for nearly 40 years, and producing excess returns of +6.5%. History may not repeat itself by creating negative excess returns over the next 20 years, but few can disagree that rising interest rates could pose challenges for the value of stocks and bonds.

Even if future long-term equity returns equal those of the past (which we think is unlikely), potential increases in equity volatility can also undermine a retiree's financial security. As the retiree begins selling assets, recouping losses in the portfolio becomes more difficult. Every day, the retiree has fewer assets and less time to wait for the market to rebound. Though investors have enjoyed historically calm markets since the financial crisis in 2008, spikes in volatility have a way of suddenly materializing—investors shouldn't be lulled into believing such benign conditions will last indefinitely.

THE “DOUBLE-WHAMMY” OF INVESTMENT AND LONGEVITY RISK

Longevity risk is especially alarming when combined with investment risk. As sources of guaranteed income disappear, retirees will need an investment portfolio to generate funds, even as their investment horizon shortens and tolerance for investment risk declines.

Imagine a 65-year old male retiree with \$2MM in a 60/40 portfolio and a 4% annual withdrawal rate funding annual expenditures of \$80,000. Considering different future market paths, we simulated whether he could generate sufficient income to last through retirement. The results are shown in Figure 4 below. If he lives until age 90 and his portfolio has an expected return of 4.4%, there is a 9% chance that he runs out of money before he dies.⁸ Picture a dinner with ten of your friends, and one of them—perhaps you—won't be able to pay their share of the check.

And if we assume expected portfolio returns of 2% per year—conservative, but not impossible—the probability of running out of money increases to 49%. If expected portfolio returns are approximately 1% per year, that probability increases to 65%.

Living an additional five years, his need for an extra \$400,000 increases the probability of financial hardship by an additional 7–12%, depending on the expected returns on his investment portfolio. Living to age 100—no longer impossible—combined with poor returns means our investor is 62–77% likely to fall short. Suddenly, almost none of your friends can pay their share of the dinner bill. Does this seem like a chance worth taking?

⁸ Assumes an expected portfolio return of 4.4%, based on a 60/40 portfolio with equities returning 5.5% on average and fixed income returning 2.75% on average, with 18% and 7% volatility, respectively. For the cases with expected portfolio returns of 1%, 2%, and 3%, the expected returns for each asset class were lowered and volatility was held constant.

Figure 4: Probability of running out of money, by survival age and expected return

		Survival Age					
		80	85	90	95	100	105
Expected Return	1.0%	4%	22%	46%	65%	77%	84%
	2.0%	2%	14%	32%	49%	62%	71%
	3.0%	1%	8%	20%	34%	46%	55%
	4.4%	0%	3%	9%	17%	24%	31%

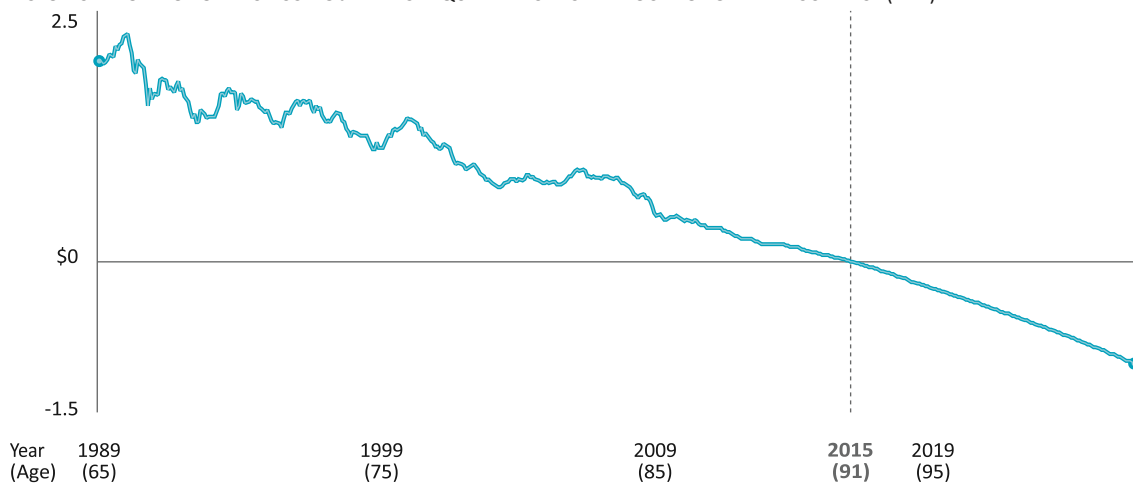
As shown in Figure 1, retirees have a 24-32% chance of living to 95

Note: Assumes an expected portfolio return of 4.4%, based on a 60/40 portfolio with equities returning 5.5% on average and fixed income returning 2.75% on average, with 18% and 7% volatility, respectively. For the cases with expected portfolio returns of 1%, 2%, and 3%, the expected returns for each asset class were lowered and volatility was held constant.

To make the “double-whammy” of investment risk and longevity risk more tangible, consider the historical performance of a 60/40 portfolio of an imagined Japanese retiree who had the misfortune of retiring at the peak of Japan’s economic boom in the late 1980s. As illustrated in Figure 5, a Japanese woman who retired with \$2MM and had \$80,000 in annual retirement expenses would have depleted her assets by 2015 because of poor investment returns during Japan’s “lost decade.” She would have been 91 at that time— just past her life expectancy, assuming she retired at age 65. If she lived until 95 (32% probability) and maintained her spending, she would have needed to “borrow” over \$300,000, likely from loved ones, as she’s a poor candidate for credit; if she lived until 100 (12% probability), she would have had to rely on her relations to close a gap of \$700,000.

Figure 5: Retirement assets for a 65-year-old Japanese investor retiring in 1989

HISTORICAL PORTFOLIO VALUE USING JAPANESE EQUITY RETURNS WITHOUT LONGEVITY INSURANCE (MM)



Note: Equity returns modeled based on total returns for the TOPIX index; fixed income returns modeled based on 10-year US Treasury rates from 1989-1996, then on the ICE BAML Japan Corporate Index returns thereafter. From the end of 2017 onwards, equity returns are assumed to be 5% per annum and fixed income returns are assumed to be 2.5% per annum. Forward-looking returns based on 2017 JP Morgan capital markets assumptions with adjustments to reflect lower expected returns in Japanese markets.

Retirees forced to rely on their families are unusual cases. For many, such dependence is not an option; they either lack relatives capable of supporting them or refuse to burden loved ones who can. More often, investors make serious lifestyle changes before depleting their assets. But even this can be difficult. For instance, if the Japanese retiree had reconsidered her plan when her asset balance reached \$500,000, she would still have had to reduce her annual expenses by 30% to \$56,000 to make her savings last to age 95. To be economically independent until age 100, she would have needed to reduce her expenses to \$41,000—close to a 50% reduction.

Either way, few working adults dream about living on a shoestring budget or depending on their kin in their retirement. They hope to live to see the grandkids graduate from college or even the great-grandkids take their first steps. But they forget that such a lifespan will cost more, requiring greater savings, higher returns or a combination of both.

These macro-trends make reducing longevity risk a core element of prudent retirement planning. In a way, retirement planning can be better characterized as lifetime planning—i.e., developing a holistic financial blueprint for all the periods of life. Successful preparation means peace of mind and financial security, while failure to plan may result in uncertainty, distress, and dependence.

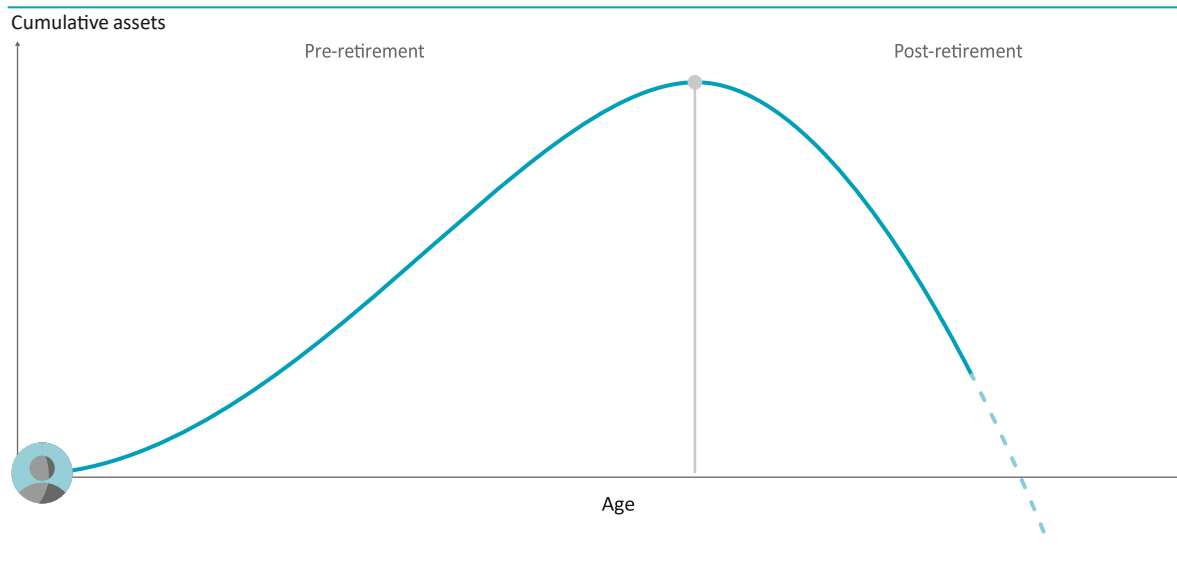
SHORTCOMINGS OF THE TRADITIONAL RETIREMENT PLANNING APPROACH

In *Illuminating the Path Forward: Breaking Free from the 60/40*, we argued that retirees can surmount the macroeconomic headwinds if they adopt a new approach to constructing their portfolios. Investing in diversified return streams with persistent positive risk premia can increase the probability of accumulating sufficient assets. But that method only tells you how to invest before retirement.

Retirement planning practices today typically visualize an investor's lifespan in two phases:

1. Pre-retirement, when the investor is looking to accumulate wealth;
2. Post-retirement, the period between the start of the investor's retirement and his or her death.

Figure 6: Phases of an investor's lifespan - investing "to" retirement



Today's retirement planning focuses on planning "to" retirement rather than "through" retirement. Planners focus on the accumulation years before retirement, often relegating financial planning of the subsequent years to simple rules-of-thumb. One example is the omnipresent "4% rule," first stated in William Bengen's 1994 paper, which used historical return data to determine "safe" rates of withdrawal from a portfolio. The well-known financial planner stated: "Assuming a minimum requirement of 30 years of portfolio longevity, a first-year withdrawal of 4%, followed by inflation-adjusted withdrawals in subsequent years, should be safe." As Box Note 2 explains, this 4% rule may not be that realistic.

BOX NOTE 2: THE "4% RULE" AND ACTUAL RETIREMENT EXPENDITURES

What's the biggest assumption underlying the "4% rule"?

It is neither investment returns, nor the longevity of the retiree. It is the supposition that the retiree won't withdraw more than 4% of the initial asset balance each year. To be sure, investors could always withdrawal less than 4% and cut back on essentials in the case of poor investment performance, but without knowing how much they'll need later in life, that decision is fraught with uncertainty.

Regardless, it seems retirees may not even adhere to the 4% rule when you consider actual behavior.

In 2015, J.P. Morgan Asset Management studied the average annual spending by age and found the following:⁹

1. For investors with \$1–2MM in investible assets, the average annual spending between ages 65 to 69 was \$201,073. By age 85, the average annual spending has only dropped to \$143,001;
2. For investors with \$2–5MM in investible assets, the average annual spending between ages 65 to 69 was \$267,096. By age 85, the average annual spending has only dropped to \$194,976.

Maybe a "6–8% rule" is more realistic.

⁹ "Spending in retirement: the final frontier." Retirement Insights. J.P. Morgan Asset Management.

Other scholars and marketers quickly adopted Bengen's maxim. In subsequent years, its simplicity and clarity made it popular. Since nobody knows how long they will live, planning decumulation around actuarial averages results in a kind of false precision.

But investors ideally need a roadmap that considers all phases of life. Predicting the length of the journey may be difficult, but one can still plan for all the possibilities, matching the inflow and outflow of assets over the totality of retirement. Contemporary financial wisdom reveals the path to retirement, but the road through it still needs to be illuminated.

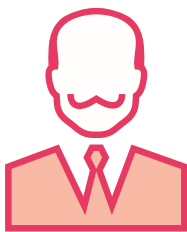
Since nobody knows their exact retirement income needs, investors need to build a conservative margin in their investment portfolios to fund any unexpected expenses from longevity. There are many ways to construct this "cushion." Figure 7 below describes three sample investors, each age 65 and with \$2MM in assets.

Figure 7: Three sample investors and their approaches for building the "cushion"



Lisa, age 65 | Houston, TX
Forced Frugality

Lisa and her husband are preparing for retirement, but fear that spending with the 4% rule will deplete their savings. She remembers an older friend ran into financial hardship because he did not spend conservatively enough and lived a long life. To build a sufficient "cushion" she needs to cut her annual spending by 17.5% to be "I need my income to be comfortable that she won't run out of money, from \$80K per year to \$66K per year, cover my expenses" and bear the reduced quality of life as a result.



Mark, age 65 | San Jose, CA
Aggressive Accumulation

Mark took a large amount of investment risk in the three years leading up to retirement in search of enough assets for a worry-free retirement. Luckily, his investments paid off, which has allowed him to retire. However, he hadn't planned for his daughter and her fiancé to lose their jobs, and needs to help them out, but he "I need to support my kids" knows he can't find money in his budget. Mark is faced with the decision of financial security or providing for his family.



Alex, age 65 | Boca Raton, FL
Precarious Preservation

Alex put money in a trust for her grandchildren to pay for their college, as her children lack the financial discipline to save. However, with another two

grandchildren on the way, she is worried she will not be able to leave enough for all of them and cover her own expenses. Taking on any more investment risk to leave a larger legacy seems too risky.

"I need to meet my
legacy obligations"

Since the size of the cushion has profound implications for the retiree's financial well-being, it should depend on how averse the investor is to longevity risk. Those who save too little, risk hardship or forced dependence, whereas those who save too much experience unnecessary deprivation.

Is there an optimal cushion size? Investors are generally familiar with the concept of the "efficient frontier" — i.e., the set of portfolios that offer the highest expected return for a specified level of investment risk, or the lowest levels of investment risk for a specified expected return. Extending the concept, how can retirees primarily concerned with retirement income choose portfolios resting on the "efficient income frontier"?¹⁰

Planners have traditionally defined "portfolio efficiency" as the expected return per unit of investment risk. In retirement planning, however, we must shift the focus from investment risk to "income risk," which is the likelihood that the retiree meets all his or her income needs in retirement. While income risk encompasses investment risk—as the asset value of the portfolio largely determines the portfolio's potential income stream—it also includes an additional source of risk: longevity risk, or the uncertainty in the lifespan of the retiree. If portfolios sitting on the traditional efficient frontier ignore this hazard, they may not lie on the "efficient income frontier."

Can any asset allocation address longevity risk? By building a cushion, the investor reduces the investment risk portion of the income risk, but no traditional asset has the capability of insuring against longevity risk. Hence, the investor can tweak asset allocations forever to arrive at an "efficient" portfolio from an investment risk perspective, but the exclusive use of traditional assets leaves an entire source of risk unaddressed. The investor unnecessarily hinders his or her portfolio efficiency. Put bluntly, it is impossible to have an optimal income efficient portfolio if the assets cannot address all the risks.

10 New York Life created the "Efficient Income Frontier" to help retirees think about the trade-off between using assets for income and passing them to heirs as a legacy.

BOX NOTE 3: TARGET DATE FUNDS: NOT A SOLUTION FOR PLANNING THROUGH RETIREMENT

In recent years, Target Date Funds (TDFs) have grown rapidly, in large part because many retirement plans own them as a qualified default investment alternative (QDIA). As of the end of 2016, TDFs have seen over \$880BN in assets,¹¹ with as much as 72% of 401K plans offering TDFs.¹²

While TDFs are useful for accumulating retirement assets, they are often poorly understood and inappropriately used. Notably, a recent SEC survey found that almost half of all respondents mistakenly believe their TDFs guarantee a specific annual return or prevention of losses.¹³ In addition, few investors read through TDF prospectuses, resulting in confusion around both how TDFs are invested and fit into the larger context of their portfolios. Indeed, fewer than half of investors correctly identified when their TDF would reach the advertised asset allocation.¹⁴

Instead, investors must understand that TDFs merely follow a glide path, corresponding to the investor's evolving risk appetite, for asset accumulation up to the target retirement date. Accordingly, TDFs are a traditional asset allocation strategy aimed at getting an investor to retirement with sufficient assets and not a novel method for investing through retirement. Importantly, they do not provide additional protection against an investors' longevity risk—i.e., the risk that investors may live longer than they expected—and as such, cannot serve as a satisfactory solution for planning through retirement.

THE MISSING ELEMENT: LONGEVITY INSURANCE

Developing a holistic life plan requires consideration of certain contingencies, and especially how those possibilities affect loved ones. The good news is that planning for lifespan-related contingencies is not a new problem.

For hundreds of years, people have sought to protect their loved ones against the threat of their untimely death. They typically elect to handle this risk in one of two ways:

1. Save more money to replace income their dependents lost; they could spend less or invest in riskier assets with higher returns.
2. Buy life insurance.

Many have unsurprisingly chosen the second option, which provides a simple, targeted solution. Life insurance simplifies an uncertain financial event, allowing the policyholder to confidently accrue assets and then spend resources. They no longer need to save excessively or chase a riskier investment "just in case."

11 Morningstar

12 SEC

13 SEC

Increasing longevity risk and shrinking retirement income complicate our ability to guard against random events. Planning for “untimely death” increasingly means preparing for both an earlier-than-expected and a later-than-expected death. In fact, the likelihood that you’ll end up utilizing coverage in the event of a later-than-expected death is more likely than actually utilizing it from an earlier-than-expected death. A 45-year-old male investor, a typical term life insurance policyholder, has a 2% probability of dying over the next ten years, a relevant protection period given the family and financial situation he is likely to be in. In contrast, consider that same man now as a 65-year-old male retiree who is debating whether he should cover the risk of living past his life expectancy. As we noted in Figure 1, he has:

1. A 24% probability of living until 95, seven years past life expectancy, and incurring an additional \$560,000 in unforeseen expenses;
2. A 7% probability of living until 100, twelve years past life expectancy, and incurring an additional \$960,000 in unforeseen expenses.

Though investors have used life insurance to guard against premature death, retirees have typically planned for unexpectedly long life by building the cushion and saving more than they probably need. But no homeowner keeps an extra \$1MM in cash just in case his house burns down; he buys insurance. Saving the money gives him the opportunity to use it more profitably. And investing very aggressively to create such a cushion means accepting large risks.

So what can a retiree do to protect against living too long, assuming he or she does not want to build a cushion? Is there a life insurance “analogue” product to cover the risk of living longer than expected, i.e., longevity insurance? Yes; they’re called annuities. But in the past, these products have been less tailored to covering contingent needs than life insurance products.

Innovative insurance companies now offer many different flavors of annuities, containing all sorts of bells and whistles. Some are basic—you send in a large check, and they pay an immediate income stream. Others are more complex—indexing the cash value to a set of equities like the S&P 500. And a few are truly complicated, allowing you to choose a number of mutual funds, while the insurance company guarantees the performance of these funds. All this suggests that annuities are more for tax-advantaged asset accumulation. As such, none of them deliver what retirees really need to address longevity risk: a low-cost, highly transparent, no-frills product that guarantees coverage of the investor’s retirement income needs should he or she live past his or her life expectancy—i.e., a pure-play protection product like term life insurance. Instead of protecting against dying too soon, this product would protect against living too long.

For a long time, retirees didn’t have a product like this. Now they do.

INSURANCE AGAINST LONGEVITY

Designed to guarantee an income stream for a retiree’s entire lifespan, longevity insurance offers a tailored solution to the costs of lengthier retirements. The policyholder gives an insurer a lump sum in exchange for life-long income guaranteed by the insurer beginning at a future date. The size of the payments is based on the age at which the policy is purchased and the date at which income starts. The longer income is deferred, the larger the payment size. There are no other frills besides guaranteed income after a certain date. Figure

8 highlights the fundamental difference between longevity insurance and other types of commonly purchased annuities: the amount spent on the premium goes toward guaranteeing an income

stream that is as large as possible at the chosen date later in life—nothing is wasted on other benefits.¹⁴ It's pure protection, not investment. It is tailored to insuring longevity risk (living too long), just as term life insurance is tailored to insuring mortality risk (dying too early).

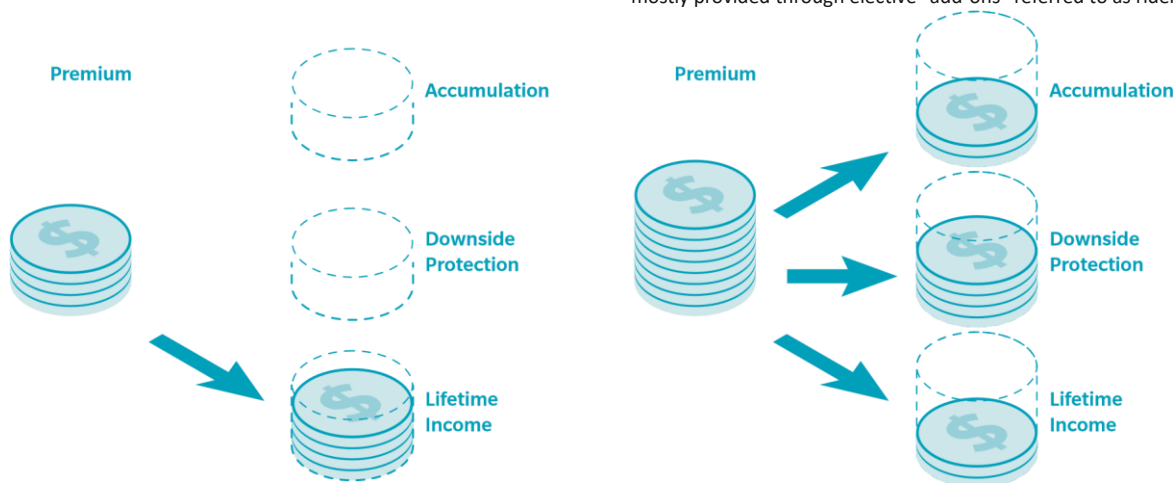
Figure 8: Longevity insurance vs other types of lifetime income products

LONGEVITY INSURANCE

First popularized in 2011—but still represents only 1% of annual annuity sales in the US. “Pure play” longevity protection products are designed to offer a guaranteed lifetime income stream after a certain date with no other frills.

OTHER COMMONLY-PURCHASED ANNUITIES

Over 75% of annual annuity sales in the US are in variable annuities or equity index annuities. Unlike longevity insurance, these are primarily investment and savings products offering tax-advantage accumulation and downside protection. Some products also offer guaranteed deferred lifetime income, but mostly provided through elective “add-ons” referred to as riders.



Like term life insurance, longevity insurance relieves the burden of complex financial planning around a contingent event and removes the need to build a cushion in portfolios. As such, retirees can confidently pursue their desired lifestyles and financial objectives. Table 1 highlights how term life insurance and longevity insurance parallel and naturally complement each other.

Table 1: Comparing longevity insurance and term life insurance: natural complements

	Term life insurance	Longevity insurance
How does it work?	Pay an upfront premium in exchange for a lump sum payment upon death	Pay an upfront premium in exchange for a certain income stream after a certain date
What does it protect against?	Shorter-than-expected lifespan	Longer-than-expected lifespan
Who is it suited for?	Younger investors in their early earning years	Older investors who are near or in retirement
Why is it suited for these investors?	The lump sum payment replaces the income lost to unexpected death	The income stream covers the expenses incurred from living longer than expected
Who else benefits from it?	The policyholder's loved ones are protected from the financial hardship that would have otherwise occurred (in the case of life insurance, replacement income; in the case of longevity insurance, not having to pay for an elderly relative)	

¹⁴ Technically, not every penny goes toward longevity protection as there are policy expenses and margins for insurers. The point is that relative to any other types of annuity policies, pure longevity insurance provides the largest “bang for the buck” in terms of the size of the guaranteed income benefit relative to size of the initial premium.

WHY DOES LONGEVITY INSURANCE WORK?

When someone buys a longevity insurance policy, the insurer invests the premiums in a high-quality investment portfolio comprising primarily investment grade corporate bonds with some allocations to loans, structured securities (e.g., mortgage-backed securities), and alternatives. The insurer takes a small portion of the return from this portfolio to cover expenses, longevity risk, and cost of capital. The insurer then passes remaining investment returns on to the full pool of policyholders in the form of guaranteed income payments that, cumulatively, exceed the notional amount of premiums that the insurers originally received.

Though an insurer cannot predict the stream of payments needed for any one individual, the law of large numbers says that it can fairly precisely foresee the stream of payments needed for a large pool of policyholders. The insurer thus prices its product for the average policyholder around the aggregate survivorship of its policyholder group over time. The total return from the longevity insurance policy would be similar to that from the insurer's investment portfolio, minus expenses, charges for longevity risk, and the insurer's profit margin.

Policyholders who live past their life expectancy would receive more payments than the average policyholder, and therefore realize a superior return on their premium payment. We refer to this additional return on their premium as the "mortality credit." The longer the policyholder lives, the greater the mortality credit, meaning the total return for an especially long-lived policyholder would vastly exceed the yield from other similarly-low risk investments. In short, using the risk pooling common to all insurance, some will "win" (those who die after their life expectancy), and some will "lose" (those who die before).¹⁵ In the context of holistic planning, longevity insurance kicks in exactly when you need it. It allows you to invest and spend the rest of your assets with the confidence that you and your loved ones will be protected.

As a practical matter, a retiree could elect to start the income just after reaching his or her life expectancy. Before this point, the retiree's costs can potentially be covered by more traditional means, such as fixed income returns or withdrawals from the investment portfolio. Should the retiree live beyond this life expectancy, however, longevity insurance and the mortality credit it provides can meet subsequent income needs. And that's the whole point: just as life insurance protects against unexpected death, longevity insurance guards against unexpectedly long life. They are two sides of the same coin, with each playing a critical role in an individual's lifetime plan.

¹⁵ Recall from Figure 2 that life expectancy increases steadily with household income. Because deferred income annuities are priced to the "average" life expectancy of its group of policyholders, those with higher household income—and therefore higher life expectancy—may be able to get an even better deal, as they will have a higher probability of living past the "average" life expectancy. In other words, those that are most likely to "win" the most tend to be those in higher income brackets.

BOX NOTE 4: WHY DO INSURERS SELL LONGEVITY INSURANCE?

You might wonder: aren't insurers also scared of the increasing longevity risk wrought by breakthroughs in life sciences? Who knows what medicine will be like in 30 years' time?

Life insurers often have large portfolios of in-force life insurance policies that carry substantial mortality risk—i.e., the risk of its policyholders' dying earlier than expected. As of 2016, there are \$20.3TN of life insurance coverage in-force, and in 2016 alone, 36 million policies—totaling \$2.9TN in coverage— were purchased. By issuing longevity insurance, the insurer effectively hedges this mortality risk by taking the opposing risk position—i.e., longevity risk, or the risk of its policyholders living longer than expected. As such, the insurer's aggregate exposure to mortality risk is reduced. Should medical science advance substantially, reduced life insurance obligations will naturally offset the additional payments to policyholders of longevity insurance. It's an excellent hedge for life insurers.

BUILDING A LIFETIME PLAN: THROUGH, NOT JUST TO, RETIREMENT

Used appropriately, longevity insurance can help transform a retirement plan into a lifetime plan, taking investors not just to retirement, but also through it. With the advent of longevity insurance, investors gain new certainty. Though the full length of life is still unknown, longevity insurance divides the path post-retirement into two segments—one where the length is known, and one where the length does not need to be known. It illuminates a path that was once dark.

There are now three phases of an investor's lifespan to visualize in financial planning:

1. Pre-retirement, when the investor is looking to accumulate wealth to build a nest egg;
2. Post-retirement, until life expectancy, the length of which is known, at which point the investor elects to receive income;
3. Past life expectancy, the length of which no longer needs to be known with the introduction of longevity insurance.

A longevity insurance policy starting payments at the beginning of the third phase generates an income stream that continues through the retiree's remaining lifespan, regardless of timeframe. The two remaining phases are clearly-defined and can be planned for using traditional tools and asset allocation.

Figure 9: Phases of an investor's lifespan - investing through retirement



Retirees no longer need to build a cushion into their investment portfolios to fund a nebulous amount of unexpected expenses. What is the financial impact of no longer needing the cushion? We discussed the “efficient income frontier” in Section 3 and noted that traditional asset allocations are fundamentally inefficient because they do not address longevity risk. Inclusion of longevity insurance, however, allows retirees to cover their longevity risk, which means that retirees can increase the expected size of their ending portfolio values (i.e., their legacy potential) while simultaneously decreasing the likelihood of exhausting their resources.

To verify this, we simulated a series of portfolios with various allocations across diversified equities, diversified fixed income, and a longevity insurance policy. These simulations capture different scenarios regarding lifespan and asset class return.¹ The income risk and expected return characteristics—i.e., legacy potential—of these portfolios are plotted in Figure 10.

In these simulations, we modeled an investor described in the box below.

65-year old male investor, \$2MM in assets

- Requires \$80,000 per year in retirement income—a 4% annual withdrawal rate
- Withdraws \$80,000 per year from the portfolio each year to meet his income needs
- For the longevity insurance portion of his portfolio, purchases a longevity insurance policy immediately—i.e., at age 65—but elects to receive income only after age 85

¹ The efficient income frontier is created by running 5,000 simulations of each allocation to deferred income annuities, fixed income, and equities for a 65-year old male investor. Across the simulations, stochastic mortality and stochastic asset class returns are used. The expected returns for equity are 5.50% and for fixed income are 2.75%, with 18.0% and 7.0% volatility, respectively. Capital market assumptions based on CAGR SQUARE estimates as of February 2018.

For ease of interpretation, we plotted four specific allocations to the longevity insurance policy:

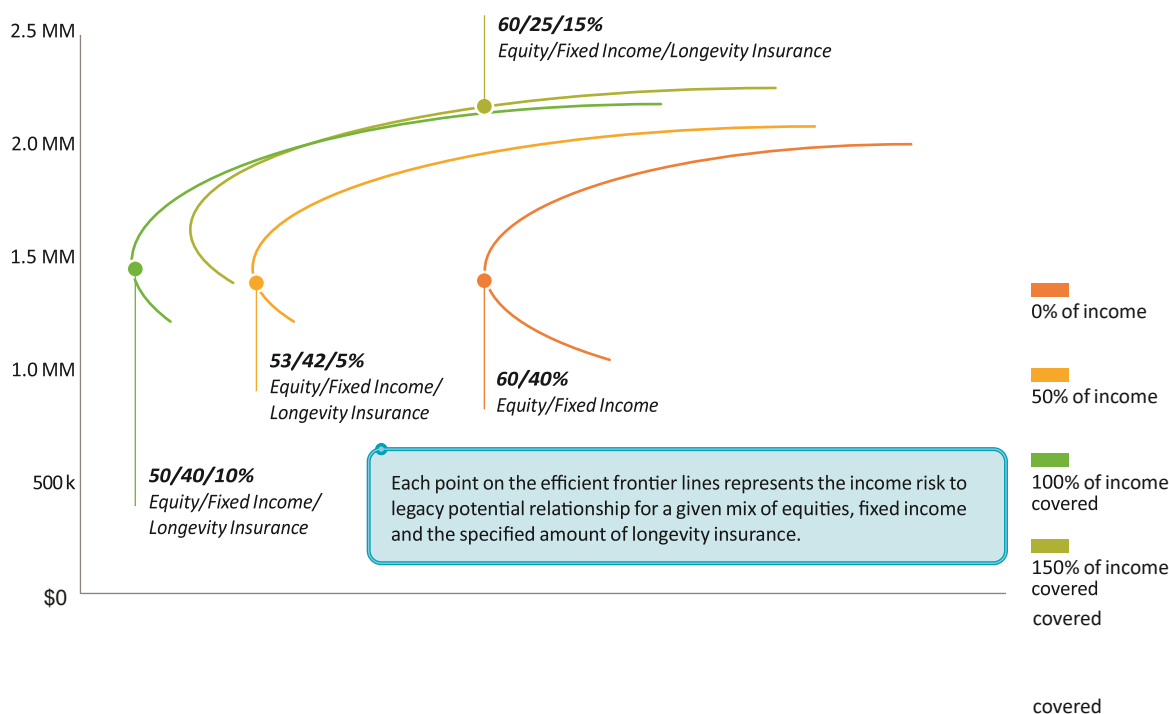
1. No allocation to the longevity insurance policy;
2. Enough to satisfy 50% of his income needs after age 85, resulting in an approximately 5% of his initial assets being used to pay for the premium;
3. Enough to satisfy 100% of his income needs after age 85, resulting in an approximately 10% of his initial assets being used to pay for the premium;
4. Enough to satisfy 150% of his income needs after age 85, resulting in an approximately 15% of his initial assets being used to pay for the premium.

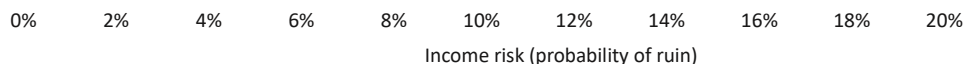
Figure 10 illustrates just how far a traditional portfolio with no longevity insurance falls below the efficient income frontier. In 9% of the scenarios simulated, the investor with the traditional portfolio ran out of money in retirement—with an expected ending portfolio value of \$1.4MM. A small allocation to a longevity insurance policy, however, improves portfolio efficiency significantly—as shown in Figure 10, any allocation shifts the efficient frontier line producing greater ending portfolio values with similar or less income risk.

Which portfolios achieve the maximum efficiency uplift? Figure 10 tells us that they are the portfolios that allocate enough to the longevity insurance policy to fully cover the income needs after reaching life expectancy. For the investor in the simulation, this amounts to ~10% of his initial \$2 million portfolio.

Figure 10: The efficient frontier from a retirement income perspective

Legacy potential (median terminal portfolio value)





Relative to the traditional 60/40 portfolio with a 9% income risk shown in Figure 10, the maximum efficiency uplift brings with it an \$800,000 increase in the portfolio’s legacy potential for the same degree of income risk. Alternatively, for an investor satisfied with the legacy potential of the 60/40 portfolio, the efficiency uplift can reduce the income risk by over 75%.

WHO SHOULD BUY LONGEVITY INSURANCE?

Put bluntly, many more people should purchase longevity insurance. But two primary characteristics determine which retirees will benefit the most:

1. **Initial financial condition:** retirees with “medium-sized” nest eggs relative to expected expenses in retirement need longevity insurance more. Retirees with large nest eggs relative to expected expenses in retirement require little income protection, as their strong financial position allows them to weather market fluctuations and unexpected longevity. Retirees with small nest eggs relative to expected expenses should focus on accumulating assets before pursuing income protection.
2. **Individual risk tolerance:** retirees with lower risk tolerance—either to market conditions or to individual longevity—should pursue income protection for peace of mind.

In addition to these primary factors, the investor should consider his or her current age when deciding whether to purchase longevity insurance right now.

Consider a young investor—e.g., someone who is 35-years-old—who hopes to receive \$50,000 in income per year after he reaches 85. The young investor has a long time until retirement. Given the substantial present value of his future income, he mostly needs to worry about untimely death. He needs life insurance to “lock in” his most valuable asset, namely the present value of his future income.

Should the investor purchase longevity insurance at this point? No, because the risk of retirement expenses from unexpected longevity is relatively small compared to the potential returns from the investor’s earnings over the many years he plans to work. Furthermore, the low average mortality rate for younger people means that the mortality credit embedded within a longevity insurance policy is also low. When purchased at a young age, a longevity insurance policy primarily acts as a regular fixed income investment without additional yield enhancement, during a time when the investor might better take a more aggressive portfolio position.

As the investor ages, however, the present value of his future income decreases, and the investor’s need for life insurance correspondingly decreases. As the time until retirement shortens, the investor loses the ability to bear investment risk. Therefore, an unexpected increase in retirement expenses from unexpected longevity begins to undermine the investor’s financial security. At the same time, as the mortality rate of the general population rises, the mortality credit embedded within the longevity insurance grows. During a time when the investor may need to shift away from risky assets, longevity insurance becomes more attractive as an enhanced fixed income investment.

Though a longevity insurance policy becomes more appealing as the investor ages, every year of delay in purchasing it creates opportunity cost. The premium increases as the time between the purchase date and the income start date decreases. In selecting the optimal age of purchase, the investor must compare:

1. The return on each dollar of investible assets used to purchase the longevity insurance policy. This is how fast the premium increases for a longevity insurance policy with a specific income start date;
2. The return on that same dollar if it were instead invested in an alternative risky portfolio.

For a more tangible example, imagine that on his 50th birthday, the investor decides to begin thinking about purchasing a longevity insurance policy. With a 3.0% interest rate environment, the investor would need an initial premium of \$60,519 to purchase his guaranteed lifetime income stream of \$50,000 per year after age 85. If he delays his purchase by one year, he would need a premium of \$62,904 for the same income stream—a net increase of 3.94% over the year. This means that if the investor can invest \$60,519 in an asset and be confident that he can realize a return in excess of 3.94% in that year, he would be better off pursuing this alternative investment instead of purchasing the longevity insurance policy.

What about purchasing the longevity insurance policy at other ages? Table 2 illustrates the premiums required for the same lifetime income stream at a variety of purchase ages, as well as the annual return that the investor would require from another investment in order to be indifferent in the choice between purchasing the annuity and waiting for the next purchase age.

Table 2: Premiums needed for a lifetime income stream starting at age 85¹

Purchase age	Premium required (\$)	Return needed for “indifference”
55	72,124	Vs. buying at 50: 3.38% p.a.
60	86,768	Vs. buying at 55: 3.48% p.a.
65	104,118	Vs. buying at 60: 3.71% p.a.
70	126,936	Vs. buying at 65: 4.04% p.a.
75	158,967	Vs. buying at 70: 4.60% p.a.

¹ Based on typical insurer pricing assumptions and methodologies. Assumes interest rates remain at 3%.

In sum, we see that:

1. As the investor approaches age 70, the rise in the annuity premium begins to accelerate, implying that the investor would need higher and higher returns from other investments in order for them to equal the returns from a longevity insurance policy;
2. The acceleration in the annuity premium coincides with the rapid decline in the retiree’s ability to bear investment risk. This means that as the retiree ages, he or she will have fewer options available to generate the required returns from safer assets and will be left with taking excessive investment risk to produce the required returns.

As Figure 11 highlights, combining financial condition and age together helps determine the type of individual who should purchase a longevity insurance policy. Of course, regardless of the financial condition and age, an individual should consider his specific risk tolerance level.

Figure 11: Longevity insurance "sweet spot"

		< 50 years old	50 - 65 years old	> 65 years old
Progress towards retirement goals	Savings low relative to income target; Off track to meet retirement goals	Focus on asset accumulation (e.g., increasing savings, increasing income) Focus should be placed on having sufficient income, especially in early periods, which can make the purchase of longevity insurance less attractive given it isn't liquid during the deferral period		
	Savings in line with income target; On track to meet retirement goals	Focus on asset accumulation Longer time horizon allows for focus on asset accumulation	High priority Proximity to retirement places emphasis on protection from income risk	Highest priority Limited timeframe to benefit from accumulation during deferral period
	Savings high relative to income target; On track to meet retirement goals	Protection from income risk lower priority Sufficiently large asset base makes reaching income goals more likely		

Though no precise wealth level corresponds to each of the rows above (as it will vary with a retiree's goals and income needs, among other characteristics), those whose net worth is likely to be greater than \$25MM at retirement may want to consider self-insuring, and those who are likely to retire with less than \$1MM, may want to focus on accumulating assets. That leaves a very large "sweet spot" in between.

THE PAYOFF

So including longevity insurance in a holistic lifetime financial plan has significant payoffs:

- Improve your odds of meeting your goals.
- Spend and leave behind more for small upfront investment.
- Enjoy the peace of mind of knowing you're protected.

IMPROVING THE ODDS OF MEETING YOUR GOALS

In Figure 12, we use three sets of expected portfolio returns to illustrate the median portfolio value at each age across many simulated market paths.¹⁷ As we demonstrated earlier, a retiree who withdraws 4% per year and invests in a traditional investment portfolio without a longevity insurance policy may find that small changes in expected returns dramatically limit his ability to pay his expenses. In the median scenario:

- An expected portfolio return of 3% would lead to full asset depletion by age 103; •
- For an expected portfolio return of 2%, asset depletion is accelerated to age 95; and
- An expected return of 1% brings asset depletion to age 90.

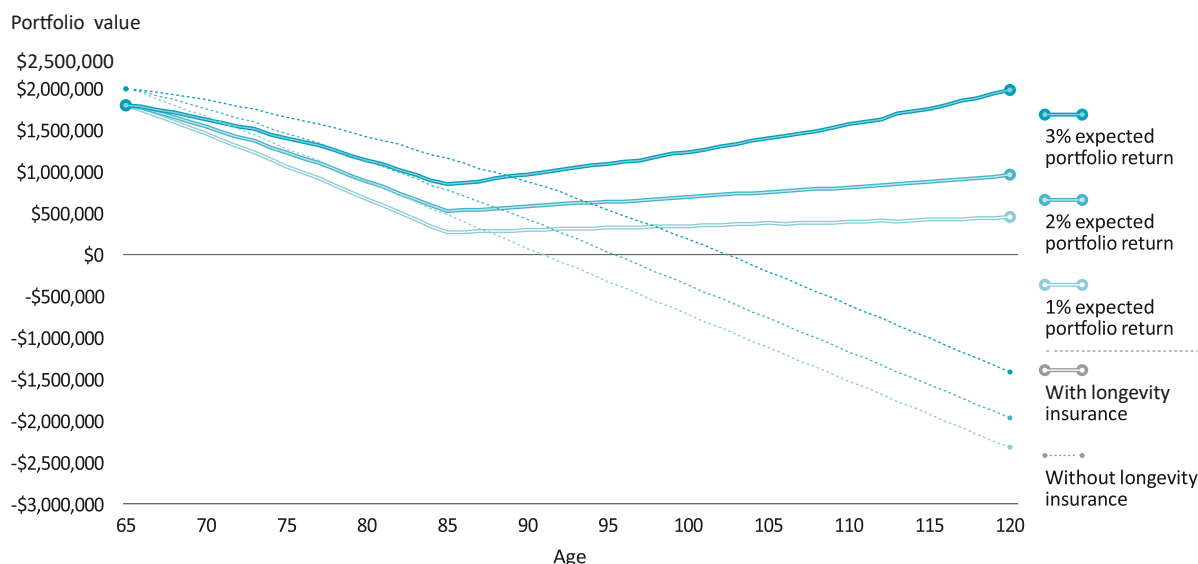
By including the longevity insurance policy in the portfolio, the retiree guarantees funding for his retirement needs after age 85. He bears investment risk a shorter time. Even with an expected portfolio return of 1%, in the median scenario, the retiree can meet all of his retirement expenses.

17 The simulations are based on a 65-year old male investor in a 60/40 portfolio, with or without 10% of his portfolio in a deferred income annuity. The simulations had stochastic mortality and portfolio returns, centered around 1%, 2%, and 3%, respectively.

Figure 12: Median portfolio value, with and without a longevity insurance policy, by survival age and return scenario

MEDIAN ASSET VALUE OVER TIME, BY EXPECTED RETURN

Based on simulations of an investor with a 60/40 portfolio, with and without a 10% longevity insurance allocation

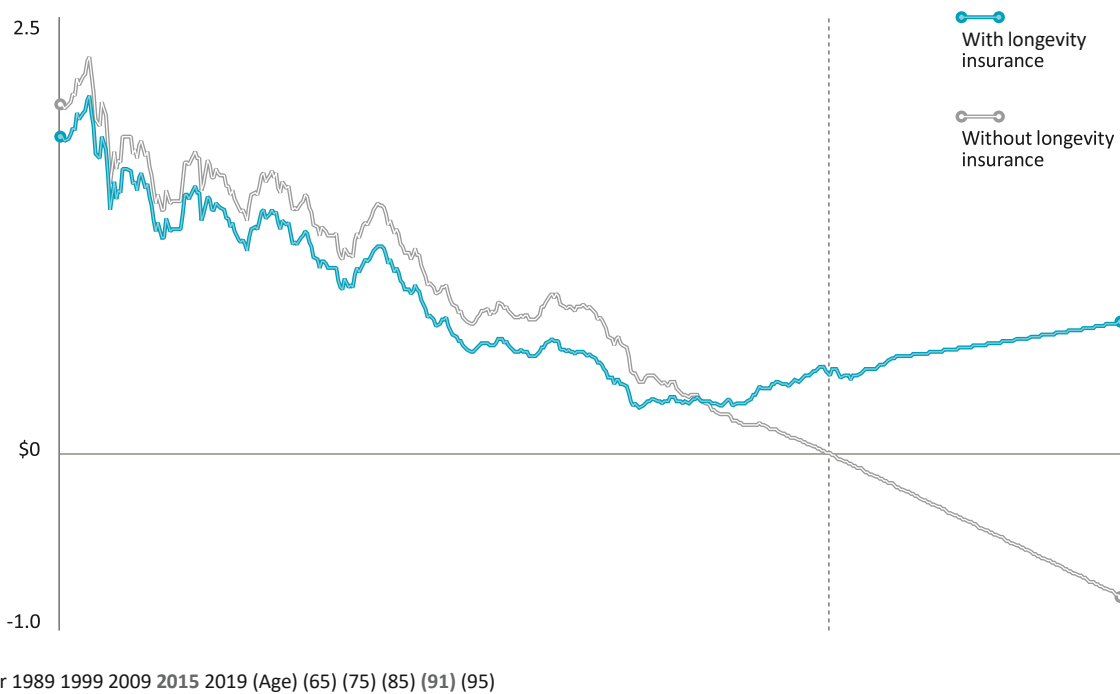


Consider the unfortunate Japanese retiree we introduced earlier who entered retirement in 1989. If she had purchased a longevity insurance policy upon entering retirement,² her income would have been sufficient to pay all of her retirement expenses, regardless of her eventual lifespan (as illustrated in Figure 13). In addition, she would have had at least \$270,000 (the lowest value her portfolio ever experiences) in unspent asset balance to leave behind as a legacy. Without longevity insurance, she would exhaust her assets. A poor credit risk, she would need to rely on her loved ones to fill in the cumulative shortfall over the rest of her life.

Figure 13: retirement assets for a 65-year-old Japanese investor retiring in 1989

HISTORICAL PORTFOLIO VALUE USING JAPANESE EQUITY RETURNS WITH AND WITHOUT LONGEVITY INSURANCE (MM)

² For simplicity, we assume that a longevity insurance policy with features and pricing identical to those today would have been available to the retiree.



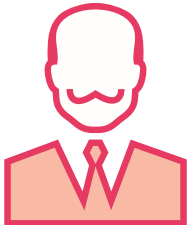
Note: Equity returns modeled based on total returns for the TOPIX index; fixed income returns modeled based on 10-year US Treasury rates from 1989-1996, then on the ICE BAML Japan Corporate Index returns thereafter. From the end of 2017 onwards, equity returns are assumed to be 5% per annum and fixed income returns are assumed to be 2.5% per annum.

SPEND AND LEAVE BEHIND MORE FOR SMALL UPFRONT INVESTMENT

Longevity insurance can empower retirees to use their savings, as well as increase their bequest to their heirs. How would the investors that we introduced earlier in Figure 7 benefit from being able to forego a cushion for unexpected expenses?

Even in a lower-return environment, the benefits of the longevity insurance policy are substantial as highlighted in Figure 14 below:

Figure 14: Potential benefits of including a longevity insurance policy

	Scenario A	Scenario B
	Without longevity insurance	With longevity insurance
 Lisa, age 65 Houston, TX Forced Frugality	Lisa and her husband cut to \$66K from expectancy covered, Lisa can \$80K/year, in order to feel wouldn't same 95% certainty it will last However, her for life. She was able to back on all maintain her quality of life, discretionary spending. Mark spent \$200K to help out his daughter, but even that amount has jeopardized	With income needs after life spending covered, Lisa can spend \$80K/year, with the comfortable they \$14K/ run out of money. year she has had to cut more in without the fear of needing withdrawals money in case she lives too long. Mark spent \$350K at the start of his retirement to bail out his daughter and her fiancé,
 Mark, age 65 San Jose, CA Aggressive Accumulation	his retirement; 15 years later, his assets are dangerously low. Now, he has gone from helping his dependents to needing them for help. Alex's portfolio had anemic returns later in life, and she ended up leaving only \$1.4M for her seven grandchildren. She was pleased to know Because the cost of education in went up, each of her grandchildren had to come potential up with an extra \$100K.	without increasing his risk of running out of money. He is 15 years into retirement with a safe level of assets, and has no need for a cushion. At the end of Alex's life, she had \$2M to leave to her seven grandchildren. She was pleased to know that her grandchildren were well cared for by her estate, especially with rising education costs.
 Alex, age 65 Boca Raton, FL Precarious Preservation		\$350K less in initial principa needed \$660K more legacy

Longevity insurance is an indispensable part of building a holistic financial plan. Of course, as with any insurance product, it is possible to purchase longevity insurance and have the risk you are insuring against (i.e., the risk of living longer than expected) fail to occur, in which case the purchaser will have paid the insurance premium but may receive no payments under the policy. However, as the cases above show, by allowing an investor to build a financial plan that addresses the risk of outliving their assets, purchasing longevity insurance can provide an investor with (i) the same financial security with higher living standards; (ii) the same financial security with less initial principal required; and (iii) higher expected asset accumulation with the same financial security. These are the outcomes of incorporating longevity insurance to build a more "income efficient" portfolio—i.e., achieving the same expected return with lower income risk, or higher expected returns with the same income risk.

ENJOYING PEACE OF MIND KNOWING YOU'RE PROTECTED

In addition to financial benefits, longevity insurance provides the income stream that provides peace of mind. In general, financial planning improves investors' sense of control, happiness, and life satisfaction.¹⁹ By removing the contingency around living past one's life expectancy, longevity insurance can further increase that sense of well-being, allowing people to stop worrying and enjoy their retirement.

This sense of confidence can itself lead to a longer life. Studies have shown that financial worry leads to depression, anxiety, sleeplessness, sickness, and poor relationships.²⁰ Longevity insurance thus can initiate a virtuous cycle, in which financial security creates well-being, which extends life while protecting retirees against the costs of those extra years.

PLANNING FOR MANY MORE TOMORROWS

In a world where retirees can enjoy the prospect of many more tomorrows, making the right planning decisions today has never been more important.

Human ingenuity has dramatically extended our lifespans, and these advances may even be accelerating. That is the good news. The bad news is that living longer, with fewer reliable sources of retirement income, exposes us to the frightening prospect of outliving our assets. But investors don't have to take this unnecessary risk. Longevity insurance is a targeted, purpose-built solution to this problem. It is the missing element required to transform a financial plan focused on getting investors to retirement, to a lifetime plan that gets them all the way through it and beyond.

19 Irving, Kym. "The Financial Life Well-Lived: Psychological Benefits of Financial Planning."

20 Bartholomae, Suzanne and Jonathan Fox. "Coping with Economic Stress: A Test of Deterioration and Stress-Suppressing Models." *Journal of Financial Therapy*. 2017.

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