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How Much Do I Need to Retire?

William Sharpe, he of the eponymous risk-adjusted return ratio, thinks this is the most complex problem he's considered in his career. It's not hard to see why. The unknowns are many: return assumptions for the portfolio, income required in retirement, lifespan, etc. Sharpe remarks that a truly optimal strategy should go year by year and thus requires consideration of over a hundred variables.

Luckily, as more Americans have transitioned away from the relative certainty of a pension plan, research in the field of retirement security has advanced significantly in the last thirty years. The *Financial Analysts Journal ("FAJ")* dedicated their entire January/February issue to a review of the literature. (The periodical turns 70 this year and is presumably thinking about retiring itself). Some of the research is geared towards pension sponsors, some geared to topics we've discussed here before (e.g. asset location), but much is relevant and new to this venue. We summarize the most important points in this month's *Investment Bulletin*.

First, a quick note on why we think this is an important topic for all clients. Thinking about retirement income helps bring clarity to all of your portfolio goals. If your goal is to consume every dollar but not run out of money then this topic is of unrivalled importance. If you have many goals, a firm understanding of your own investment income requirement brings confidence to a decision to gift to charity, or use the lifetime exclusion to move assets to your heirs, or commit to funding your grandchildren's education.

Focus on Income not Assets

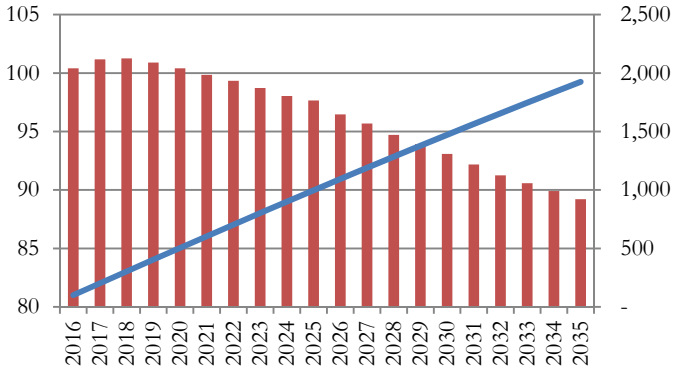
Writing in a separate journal, the *Harvard Business Review*, Robert Merton laments one of the casualties of the move from the defined benefit (pension) plan to the defined contribution (401k/IRA) plan. A prospective retiree thirty years ago might have said that their retirement is worth "two-thirds of my final salary." Today's retiree says "five million dollars." The result of this mindset is that volatility is only considered in terms of asset value fluctuation. Prospective income fluctuation is ignored, yet it deserves at least as much attention. Sometimes the two are related, but sometimes not.

Changing the focus requires a way to think about accumulated assets in terms of the income it can buy. Probably the easiest way to do this is to inquire with an insurance company as to the amount of real, or inflation-adjusted, guaranteed income the assets can buy via an annuity. There is an embedded credit risk to each insurance contract, however, and fees can further complicate the picture. Zvi Bodie* suggests the better approach is to determine how many Treasury Inflation-Protected Securities ("TIPS") maturing in each year of retirement can be purchased.

TIPS are issued by the US government and thus come with the same risk-free assumption as any other type of Federal debt. Further, their principal is adjusted each year by the inflation figure tracked by the Bureau of Labor Statistics' consumer price index ("CPI"). Owners of these securities no longer face inflation risk, assuming of course that the CPI closely reflects their own cost of living. There are other considerations TIPS owners must weigh, especially related to their taxation, but that is outside the scope of this piece.

Figure 1 gives a sense of what it would cost for $100 in real retirement income in each of the next twenty years if accessed through today's TIPS market. Short-term real rates are negative right now; investors actually have to pay more than $100 today in order to earn $100, measured in today's dollars, for each year to 2020. Thereafter, real rates turn positive. In the last year presented the cost of $100 comes down to $89. The diagonal blue line tallies up the total cost: over twenty years $100 in constant purchasing power costs $1,925 today. You might therefore look at your portfolio and assume you can buy inflation and credit risk-free income, for twenty years, worth 5% of your assets. (This equates to an effective real return on your assets of roughly 0% – a disheartening fact, but a fact nonetheless due to the extraordinarily low rate environment).

Figure 1: The Cost of Real Income
Cost of $100, inflation-adjusted, in given year (**LHS**)
Cumulative cost (**RHS**)
Calculated from TIPS yields as of 02/09/2015
Source: Bloomberg



The takeaway is that the concept of a risk-free portfolio should change for the prospective retiree. Most investors think of risk-free as cash (its nominal, or unadjusted for inflation, principal value does

not fluctuate) or as a regular government bond (its nominal coupons are fixed and nominal principal is fixed at maturity). However, the most relevant risk to the retiree is a change in real, not nominal, income. This is most closely hedged by a portfolio of TIPS corresponding to the retirement period.

This should not be construed as a recommendation to allocate any or all assets to TIPS. Equities and other assets can be an integral part of a retiree's portfolio. However, the author would say that the risk/return tradeoff of other asset classes should be judged against what could be purchased in the TIPS market.

Flexibility Required

Barton Waring and Laurence Siegel write on the most frightening topic for prospective retirees: how do I ensure I don't run out of money? The answer is lean on secret sauce, but still practical. Revisit the TIPS market, or annuity market, each year and ask how much annual income your remaining assets can buy, then spend only that amount. Returning to Figure 1, an investor with $1,925 at the beginning of this year and a twenty year life expectancy could spend $100. If the same investor expected to live for ten years, he or she could spend $193 ($1,925 divided by the $998 requirement then multiplied by $100).

The point of their analysis is to push you to think about how flexible you can be when drawing on your retirement portfolio. The famous 4% spending rule is perhaps a useful tool, but the authors would argue that you could take more in good years and should take less in meager years to increase the probability of extending your assets. A 20% loss in any given year would reduce the amount of annual risk-free, real income available by precisely 20% assuming no change in TIPS yields. If that reduction is acceptable, then a portfolio with such a drawdown expectation may be appropriate.

The Longevity Gene

You may have noticed that we have ignored perhaps the most important variable – how long will you live? If you could tell us the answer that would make this all a whole lot easier! Provided you cannot, the entire life insurance industry was built for people like yourself.

The idea of an annuity is financially elegant – no sense in individuals bearing their own longevity risk when it can be pooled and hedged by a life insurance company. But annuity uptake is rather small in the US (9% of retirement assets in 2011 per Standard & Poor's). It may be that the product suffers from adverse selection. For example, if only those who have reason to believe they have a good chance of outliving their life expectancy purchase the product, and insurance companies suspect this is going on, then they must increase prices to protect themselves. This would result in an overpriced product from the perspective of the average retiree. There can be other problems too, principally the loss of control of the assets.

Stephen Sexauer, Michael Peskin, and Daniel Cassidy complete the analysis of the retirement problem with the concept of *deferred income* annuities. These differ from a regular annuity in that payments do not begin immediately and therefore cost is much lower. They propose retirees buy an annuity that pays off only in the years beyond their life expectancy. You might think of this as a longevity tail risk hedge.

The analysis presented in Figure 1 intentionally covered twenty years, which just happens to be the life expectancy of a 65 year old woman today according to the Social Security Administration (a 65 year old man expects to live to 82 ½). The authors believe that hedging the years beyond your life expectancy is inexpensive. In 2010 such a deferred income annuity would only cost 150% of one year's real income. (Keel Point has not inquired as to the fairness of this price in today's environment). Extending the Figure 1 result, the risk-free inflation-adjusted lifetime retirement income would cost about $2,100 for every $100 of real annual income.

How much do I need to retire? While the question is a challenging one, both in its complexity and its application in today's zero real interest rate environment, we do think these academic contributions are helpful for framing the problem. We find it's always helpful to consider the risk-free alternative, in this case a portfolio of TIPS potentially with a deferred income annuity hedge, to an investment strategy. □

*Unless otherwise noted, the authors cited in this article were published in the January/February 2015 issue of the *Financial Analysts Journal.*