
Applying Actuarial Science to Income Planning

By Kerry Pechter *Fri, Jan 17, 2020*

Adviser Mark Shemtob uses actuarial science to analyze and compare retirement income strategies that employ both annuities and investments.



While impartial experts have repeatedly shown that income annuities can supercharge a retirement portfolio, relatively few people—not retirees or advisers or even the actuaries who build annuities—buy them, let alone use them to maximum advantage.



Shemtob

At the Society of Actuaries' "Living to 100 Symposium" this week, actuary and Certified Financial Planner (CFP) Mark Shemtob became the latest in a long line—from [Menahem Yaari](#) to [Wade Pfau](#)—to make the case for adding a single premium immediate annuity (SPIA) to a retirement income plan.

Because of his actuarial background, Shemtob's approach is unusual. "Actuaries typically work in institutional settings," he told *RIJ*. "I introduce actuarial science into individual retirement planning."

Shemtob has also developed an information platform ([REST](#) or Retirement Education and Strategy Tool) and a basic calculator for analyzing and comparing strategies. Not least, he claims success in persuading many of his wealthy clients to embrace annuities.

At the symposium, Shemtob presented his method. The steps involve estimates of life expectancy, returns, balances, and income gains for every year between retirement and anticipated age of death, based on 10,000 randomizations. His methodology can be found in the chart below; I'll cut to his case study.

AN ACTUARIAL MODEL

- An expected age at death (EAD) is randomly generated based on life expectancies
- For each year up to the EAD, a gross income goal (GIG) is established.
- For each year up to the EAD, rates of return are generated based on assumptions and asset classes.
- For each year up to the EAD, investment earnings are calculated based on investment balance (IB)
- For each year up to the EAD, the projected income (PI) from each source is calculated
- The amount of the IB used each year will vary as is needed to satisfy the GIG for the year
 - If total PI is > the year's GIG, the IB is increased by the excess.
 - If total PI is < the year's GIG, the IB is reduced by the shortfall to meet the year's GIG
- For each year (total PI)/GIG is calculated. Will start at 100% but likely drop in later years.
- At each EAD the (remaining IB) / (initial IB) is calculated. (Can be done on an inflation adjusted basis)
- All the above is repeated 10,000 times
- Average (total PI)/GIG & (remaining IB)/(initial IB) at each EAD is determined from 10,000 simulations

A path to steady income and high final wealth

A healthy 62-year-old woman wants to retire immediately. She has \$1 million saved, a mortgage-free home, and a buyout offer from her employer of \$5,000 a month for three years. She expects \$2,500 a month from Social Security at age 66½. Her income goal is \$6,000 a month, growing at 2% per year to offset inflation.

Based on her health and gender, this client has a life expectancy of 90 and a 16% chance of reaching 100. Shemtob assumes annual growth rates of about 3% for fixed income and about 7% for equities (with standard deviations of 4.4% and 15.6%, respectively), a 2.6% inflation rate and a retail SPIA payout rate of \$5,880 per year per \$100,000 in premium.

Using the method in the chart, Shemtob compares three strategies for their relative ability to maximize reliable income or maximize final wealth. For simplicity, he ignores taxes, home equity and long-term care costs.

- Strategy A. Taking Social Security at age 62, using a 60/40 stock/bond investment portfolio, and not buying a fixed income annuity.
- Strategy B. Taking Social Security at age 66, using a 70/30 portfolio and buying a \$250,000 fixed income annuity.
- Strategy C. Taking Social Security at age 62, using an 80/20 portfolio and buying a \$500,000 fixed income annuity.

In each year, the hypothetical client withdrew enough from her investments to meet her income goal, dipping into principal only if the previous year's earnings plus guaranteed sources of income didn't satisfy the amount projected under the plan.

If you're new to this type of analysis, you might be surprised that Strategy C produced the most reliable income *and* the highest final wealth. Strategy A showed steady income and modest wealth growth to age 85, but only 70% of desired income at age 100. Strategy B showed 90% of desired income even at age 100, and steady legacy growth, but not as rich as Strategy C.

What's the catch? The annuity buyer has to accept a big drop in liquidity at the start of retirement in the belief that her riskier asset allocation—made possible by \$29,400 in safe annual annuity income—will pay off in higher returns in the long run.

"People avoid annuities because they're afraid it will hurt their kids [by reducing their inheritances]. But if you live long enough, the purchase of an annuity actually helps your kids,' Shemtob said.

So why don't more retirees supplement Social Security and investment gains with annuities? Most people get their retirement advice from investment advisers who aren't familiar at all with annuities, or whose business model doesn't accommodate commission-paying annuities, or from insurance agents accustomed to selling only packaged products.

What *RIJ* calls "ambidextrous advisers"—professionals who are adept at blending insurance products and investments for maximum income and maximum safety in retirement—still represent only a tiny percentage of the hundreds of thousands of financial intermediaries in the U.S.

The market for SPIAs is limited for several reasons. Independent agents and advisers historically earn lower commissions by selling SPIAs than by selling deferred fixed indexed annuities (FIAs) or deferred variable annuities (VAs), so many potential clients never hear about SPIAs. It's also likely that many retirees regard Social Security as the only annuity they need.

Life insurers hope that demand grows for no-commission FIAs or VAs among clients of registered investment advisers (RIAs), and that an appetite for guaranteed lifetime withdrawal benefits develops among participants who own target date funds in 401(k)s. The scenario that Shemtob described remains more the academic ideal than the marketplace reality.