An Algorithm That Loves Annuities

By Kerry Pechter *Thu, Jun 5, 2014*

PrARI, the retirement product allocation calculator that Cannex recently acquired with its purchase of the Qwema Group, shows advisers how to maximize retirement income (or legacy) using a blend of mutual funds, variable annuities and income annuities.

Decumulationistas, to coin a term, tend to believe that a lot of Americans could probably spend more money with less risk during retirement if they allocated their savings to a blend of annuity and investment products rather than to investments or annuities alone.

Such a product allocation, the theory goes, pays off in at least three ways. It uses mortality risk pooling to boost income; it reduces the need to hoard against uncertain future expenses, and it lets people gamble a little with their liquid investments without losing sleep.

But how do you optimize such a strategy? And how can you do it in an intellectually rigorous way that:

- Incorporates the major knowns (income needs, existing resources, legacy desires)
- Adjusts for the major variables (product fees and features; broker-dealer suitability restrictions) and
- Doesn't fudge the major uncertainties (market risk, sequence risk and longevity risk) by assuming average values

In 2008, Moshe Milevsky's QWeMA Group in Toronto tackled this multidimensional problem. Using partial differential equations, they developed a calculator to generate custom allocations within a portfolio with three types of products: mutual funds, variable annuities with lifetime income riders, and fixed income annuities.

The calculator's acronym is PrARI, or Product Allocation for Retirement Income. This past spring, Cannex, the Toronto-based financial product data distributor, acquired QWeMA and PrARI. According to Faisal Habib (below right), the president of QWeMA at Cannex, the deal is a win-win for the two firms. The PrARI tool will add a service element to Cannex data products, and the Cannex distribution network will introduce PrARI to a wide audience of broker-dealers.

Insurance company broker-dealers are the most logical audience. Manulife and John Hancock (Manulife's U.S. unit) were early adopters of PrARI. Then Pacific Life licensed the tool. More recently, Principal

Financial has rolled it out. (Those firms could not be reached for comment before deadline.) So far, about 5,000 advisers have access to PrARI, Habib told *RIJ*, and use it as a sales, education or planning tool.

Triple threat

PrARI creates portfolios of mutual funds, VA with income riders, and income annuities for a specific reason. Those three product classes address, respectively, three of the biggest financial risks that retirees face: dilution of spending power by inflation, pressure to liquidate depressed assets ("sequence" risk), and the risk that they'll outlive their savings (longevity risk).

"Each product gives you a certain hedge for a certain cost," Habib told *RIJ* recently. "PrARI gives you a cost-benefit analysis. We can say to the client: this particular combination works in your best interest." Those three products are for everyone, he adds. They're mainly for retirees who can't get enough income simply by withdrawing about four percent of their savings each year.

To find a blend of those products that meets a retiree's financial needs and desires with the best chance of success, PrARI needs several inputs. These include the client's personal and financial information (e.g., age, assets, income needs, sources of guaranteed income); product information from the Cannex annuity database (now supplemented with VA data through a partnership with Beacon Research); and the broker-dealer's suitability parameters, whatever they might be.

To calculate the probable success of a given product allocation in producing the income a client needs, PrARI feeds all of this information into the algorithm that Moshe Milevsky's Qwema Group, a private consulting firm, created about six years ago. This algorithm is unusual: It estimates probabilities of success by using "numerical analysis" instead of the more popular Monte Carlo simulations.

In the world where most retirement calculators use the Monte Carlo approach, that's significant. To get an accurate probability assessment from a Monte Carlo simulation, you have to run millions of projections. That requires too much expensive computer power and time—too much for an everyday adviser-client desktop calculator like PrARI. Numerical analysis offers a short cut. Based on a few carefully chosen samples, it quickly and cheaply interpolates a result that's still accurate enough for planning purposes.

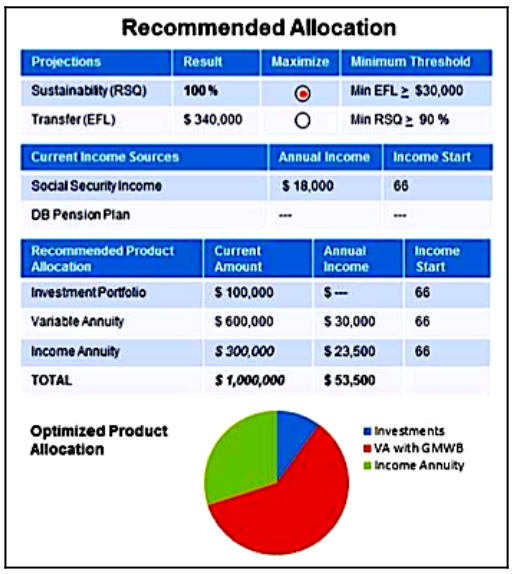
Numerical analysis

Here's a crude analogy: A journalist on deadline might confirm a disputed event or fact by calling three knowledgeable people. If all three agree on the facts, the reporter proceeds with the story. The accuracy of that technique, and of numerical analysis, depends on the skill with which the samples are chosen. A Monte Carlo approach might, by contrast, involve asking hundreds of randomly chosen people a single question.

Habib provided *RIJ* with screenshots of the inputs and outputs of a highly simplified sample PrARI calculation. The hypothetical involved a newly retired 66-year-old single New Yorker with $1 million in savings, with 60% in stocks and 40% in bonds.

The client expected $18,000 from his inflation-adjusted Social Security but wanted a total retirement

income of $55,000, increased by 3% per year for inflation. He wanted a 90% chance of maintaining his desired income for life. He had no legacy desire.



Recommended Allocation

Projections	Result	Maximize	Minimum Threshold
Sustainability (RSQ)	100 %	◉	Min EFL ≥ $30,000
Transfer (EFL)	$ 340,000	○	Min RSQ ≥ 90 %

Current Income Sources	Annual Income	Income Start
Social Security Income	$ 18,000	66
DB Pension Plan	---	---

Recommended Product Allocation	Current Amount	Annual Income	Income Start
Investment Portfolio	$ 100,000	$ ---	66
Variable Annuity	$ 600,000	$ 30,000	66
Income Annuity	*$ 300,000*	$ 23,500	66
TOTAL	*$ 1,000,000*	$ 53,500	

Optimized Product Allocation

PrARI offered a side-by-side comparison between a classic systematic withdrawal from mutual funds and a customized blend of funds and annuities. Both projections called for maximizing income over legacy value. The SWiP program entailed an annual inflation-adjusted drawdown starting at $37,000 from the $1 million (in a 60% equity/40% bond portfolio) to supplement the $18,000 in annual Social Security benefits. This strategy yielded a success probability of 88%, with an expected legacy value of $376,000.

According to PrARI, the blended solution was better. It generated an income of $71,500 from three sources: Social Security, a $300,000 SPIA (with 10 years certain) paying $23,500 a year for life, and a $600,000 VA/GLWB (50/50 equity/bond allocation) paying $30,000 for life. The plan left $100,000 in cash. The estimated legacy was $340,000 and the probability of meeting the original $55,000 annual income requirement for life (what Qwema calls the RSQ or Retirement Sustainability Quotient) was 100%.

A credible basis for sales

In the world of financial product distribution, at least in channels where the culture, the incentives, and the licensing aren't biased against insurance products, a calculator like PrARI has obvious potential to help financial advisers sell more guaranteed income products.

"For an insurance agent who has never sold mutual funds, or for a registered rep who has only used systematic withdrawal and never an annuity, this tool helps them in suggesting and justifying alternative solutions," said Habib. "It's a value-add for them."

Each distributor that uses PrARI "white labels" it and puts its own product options and suitability guidelines into the system. Cannex, as a purveyor of data on products from hundreds of insurance companies, tends to remain product-agnostic.

“We didn’t want to be seen as partial to one set of products or another. We had a unique proposition in product allocation. We never wanted Qwema to be seen as the development arm of any particular company,” Habib told *RIJ*.

PrARI does, however, exclude certain products when their terms aren’t attractive. “The tool is client-focused. If the fees are too high, or if the withdrawal rates or crediting rates are too low, then you’ll see the allocations move out of them,” he said.

In some cases, PrARI produces no recommendations at all. As retirement advisers know, clients don’t always have enough savings to spend as much as they’d like during retirement and still avoid ending up without enough money to live on.

“The algorithm won’t magically bring them an adequate income. Advisers say, ‘If I put all my client’s information in, why don’t we get a solution? Why doesn’t my client get more income?’ We tell them, ‘We can’t go against the market. If you don’t have enough you don’t have enough,’” Habib said.

“The question then comes up, ‘What can I go back to my client with?’ We tell them: Ask the client to save more, delay retirement, or consume less. The adviser says, ‘You are making my life difficult.’ But there’s a no other way to do it. We can put in all the complex math and the theory of actuarial science, but sometimes it won’t give you an answer.”

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