QWeMA GROUP INC.

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Retirement Income: Analyzed

Newsletter from The QWeMA Group

Question of the Month: What is a Guaranteed Lifetime Income Benefit on a GLWB really worth?

Answered by Moshe A. Milevsky

"My VA with a Guaranteed Lifetime Income Benefit is promising me '5-for-life' and a 7% bonus while I wait. What's that promise really worth – how does it compare to T-bill and bond yields?"

In this month's newsletter, you will learn how to **use the IPAF function in QVEL** to answer this question – so you can understand and explain the economics of guaranteed lifetime income benefit products.

Taking a closer look

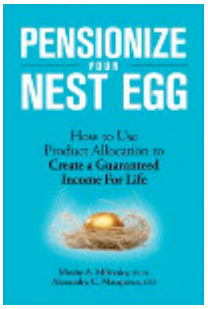
Say you have a client who is 55 years old and wants to invest $100,000 in a GLWB offering a minimum 7% guaranteed growth rate over 10 years. The policy contract also provides that the income base – whatever it is at the withdrawal commencement date, and we have chosen age 65 – will be multiplied by a guaranteed withdrawal rate, say 5%, to determine your client's lifetime income benefit.

The *growth guarantee* tells us that, at the very least, your client will have an income base of $196,715 by the age of 65. And the *withdrawal guarantee* tells us that he can expect a minimum guaranteed yearly income of 5% of the $196,715 base, or approximately $9,836 (nominal) per year for life.

You can calculate the income base by multiplying $100,000 times (1.07)^10; and the withdrawal amount by multiplying the resulting number by 0.05, assuming the growth bonus for waiting is

New book! Pensionize Your Nest Egg:

How to Use Product Allocation to Create a Guaranteed Income for Life



The QWeMA Group announces the publication of this new book by CEO Moshe Milevsky, Ph.D. and Special Projects Manager Alexandra Macqueen, CFP.

This accessible work is intended for retirement income practitioners and their clients alike, and includes a seven-step process to measure and adjust the sustainability of your retirement income plans.

Using Actuarial Assumptions in

compounded, not simple interest (if the bonus is listed as simple interest, you have to convert it into a compounded rate).

Did you ever wonder...

…what it would cost your client to purchase a basic pension at age 65 which pays the same $9,836 per year for life?

This is not a hypothetical question. There is an active market for single premium income annuities which have been sold by major insurance companies for hundreds of years. The IPAF function in QVEL tells us that the current cost of a $9,836 per year annuity at age 65 is about $111,000. You will see how this is done in a moment.

As you may have immediately noticed, this cost is about 43% less than the guaranteed income base amount of $196,715.

Already this should tell you that the "investment Celsius" guarantees provided with the GLWB may not translate completely to the "economic Fahrenheit" we are hard-wired to understand and use in the rest of our investment decisions.

But what is the yield on the $100,000 GLWB deposit premium which has that deposit turn into $111,000 (the cost of an equivalent lifetime income stream at age 65) over 10 years?

Using QVEL to solve for the cash-equivalent yield

Once you know your client's age and gender, the amount they are interested in depositing (the deposit premium), and the age at which they want to start to receive income, you can use the IPAF function in QVEL to solve for the cash-equivalent yield of a guaranteed lifetime income benefit product.

Step 1: Use QVEL to calculate the annuity factor

First, use the QVEL IPAF function to determine the *annuity factor* for your client, which is the present value of an income stream that generates $1 of lifetime income for that client.

To use the IPAF function, you will need to enter the following variables (or "arguments" in Excel): the age at which income begins, the valuation rate used to discount future (annuity) cash flows, and the gender-specific L, M and B components which provide

QVEL Functions: L,M and B values

The L,M and B parameters are mortality values. These can be derived from life tables.

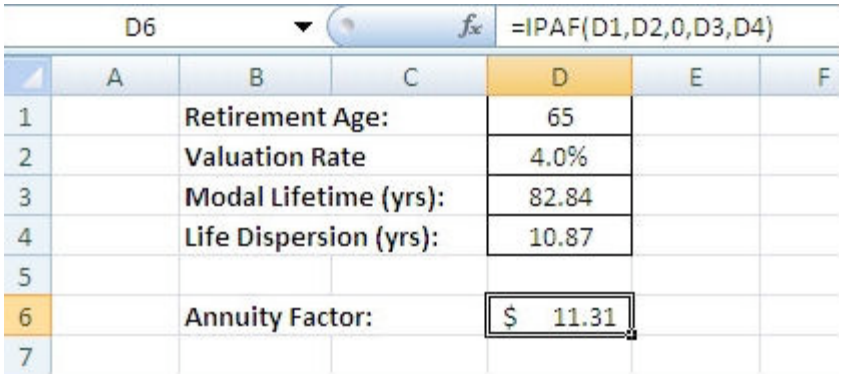
The parameters used in this month's example are:

	L	M	B
Male	0	82.84	10.87
Female	0	87.24	10.77

the mortality assumptions for the calculation.

(The M parameter is a modal value which gives average life expectancy - you can see it is about 83. The B parameter provides the dispersion of life around the modal value - think of it like a "standard deviation of life expectancy." Finally, the L parameter accounts for accidental deaths.)

Here's how the IPAF function looks as a regular function call in Excel, together with the solution:



In our case, we are using a 65-year-old male, and a valuation rate of 4% (current in October 2010) to discount future cash flows.

The resulting solution of 11.31 is the annuity factor we will use in calculating the annual investment return that has the initial deposit premium of $100,000 become $111,000 – the cost of $9,836 of annuity income at age 65.

Step 2: Use the annuity factor to calculate the cash-equivalent yield

Now that you have the annuity factor, you are ready to calculate the cash-equivalent yield for your client's proposed purchase.

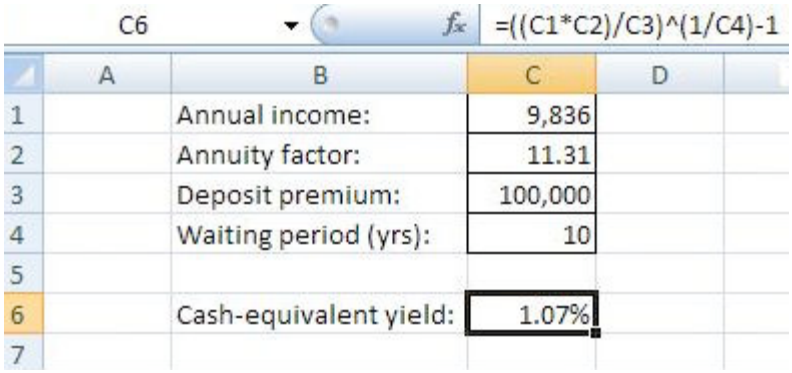
Recall that we calculated the annual income from the GLWB as follows, using the 7% growth guarantee and the 5% withdrawal guarantee:

(100,000*(1.07^10))*0.05 = 9,836

Once you have the solution to that calculation, here's the equation you will need to enter into Excel:

((annual_income x annuity_factor)
/deposit_premium)^(1/waiting_period)-1

In our case, here's how that equation looks in Excel, together with the solution:



The bottom line

Here's the bottom line: in the (7%, 5%) guarantee pairing, the cash-equivalent yield for this guaranteed lifetime income benefit works out to a meager 1.07%. *That is the true value of the growth and withdrawal rate combination*. And that is a number in units you and your clients can understand and directly compare to bank interest, mutual fund returns and T-bill yields.

You can use the same equations we've provided here and change the withdrawal and bonus rates to calculate the cash-equivalent yield for different GLWBs. For example, the same $100,000 deposited for the same client into a GLWB with a 6% bonus rate and 6% withdrawals has a cash-equivalent yield of 1.97%, as follows:

(100,000*(1.06^10))*0.06 = $10,745

((10,745 X 11.31)/100,000)^(1/10)-1 = 1.97%

Varying the ages, waiting periods and guaranteed growth and withdrawal rate combinations for these products will lead to a range of cash-equivalent yields, but they always, inevitably work out to something less than the growth rate marketed with the policy.

In closing, there can be no doubt that allocating a portion of your client's nest egg to a variable annuity with a guarantee can be an excellent risk management strategy, but **use the power of QVEL**

functions to be sure you and your clients know what you're buying – and that you buy for the right reasons.

A version of this article appeared in Research Magazine. The original article is available at www.researchmag.com.