

## ANNUITY ANALYTICS

BY LOWELL ARONOFF

# Income Annuities Demystified

**B**Y THE TIME AN INVESTOR IS READY to purchase a life annuity, he has generally had experience with many financial products. Whether the vehicle is stocks, bonds, mutual funds or saving accounts, investors tend to measure performance primarily by the yield or interest rate received on the investment. An income annuity, which is also called a SPIA (single premium immediate annuity) or a life annuity, has both an insurance as well as an investment element.

An income annuity is like a defined benefit pension. They both pay a monthly benefit for life. We don't know how long any specific individual will live so there is no completely satisfactory way to calculate a yield for life annuities, but there are a number of solutions that help. The most straightforward is a graph showing the yield an annuitant would receive if he lived one, two and more years. The adjacent graph shows the yield that a 65-year-old male who purchased a life annuity in June 2010 with 10-years certain would earn using data provided by CANNEX.

Does this life annuity provide a good

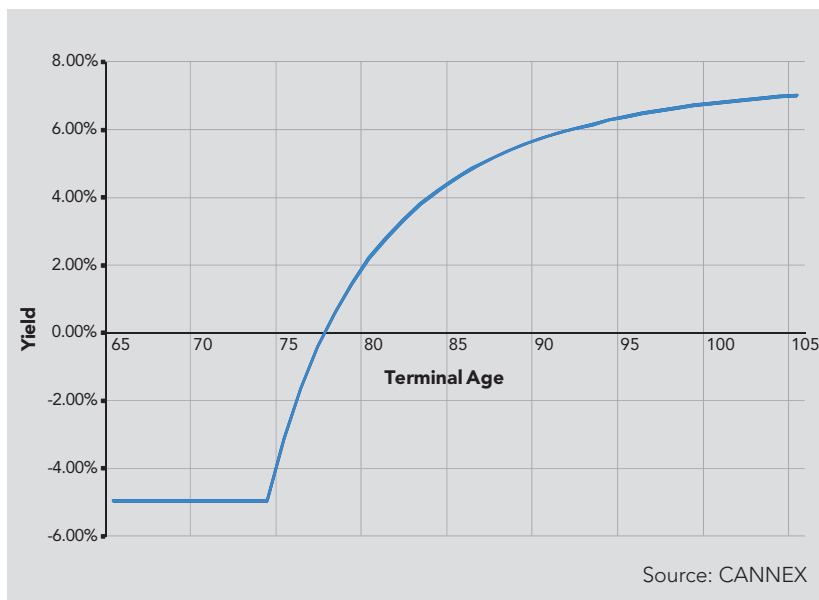
return? It depends — if the annuitant ends up living to an old age, the yield would likely be seen in retrospect as excellent, but if there is reason to suspect that the annuitant will die younger than others of his age and if he does not qualify for an impaired risk annuity, other investments should be considered.

This result is seen in the graph below where the yield from the income annuity is negative for the first 13 years. In other words, if this annuitant lives for

only 13 years or less he would receive a negative return. Statisticians tell us that there is nearly an 80 percent probability that a 65-year-old male will live more than 13 years.

An investor can guarantee that the income annuity will always provide a positive return by choosing an income annuity with a longer certain period. In this case a life annuity with a 15-year certain period guarantees a positive yield.

Based on a calculator provided by



## How the Yield from a Life Annuity compares to a Corporate Bond Fund

Product	Duration	Minimum Yield	Maximum Yield
Life annuity, 22 years certain	11.2	3.6%	6.2%
Morgan Stanley Long Duration Fixed Income (MSFIX)	11.0	4.8%	4.8%
Life annuity, 30 years certain	12.8	4.5%	5.6%

Note: The "maximum yield" shown is the yield if the client lives to age 110.

Source: CANNEX and Morningstar

the Society of Actuaries, a 65-year-old male has a life expectancy of about 22 years. If the investor chooses a life annuity with a certain period that's as long as his life expectancy, then he could get a rate with a yield that's guaranteed to be at least 3.6 percent. Financial analysts use a metric called "duration" to find bonds with comparable cash flow. The duration of a life annuity with a 10-year-certain period is 10.4, while the duration of a life annuity with a 22-year-certain period is 11.2. As seen in the table above, corporate bonds from companies with similar ratings and similar durations are available.

The graph below shows the yield

curve of life annuities with a 10-year certain period versus a certain period equivalent to the annuitant's life expectancy. Generally, a shorter certain period results in a lower guaranteed yield, but a higher yield in the event that the annuitant lives to an old age.

Should an investor buy a life annuity with a long certain period or a short one? It depends — if the investor is looking for an annuity that will maximize his annual income or one that will maximize his yield in the event that he lives to an old age, he should buy a life annuity with a short guarantee. On the other hand if the investor is looking to ensure that the investment will receive a high yield even if he dies young, he

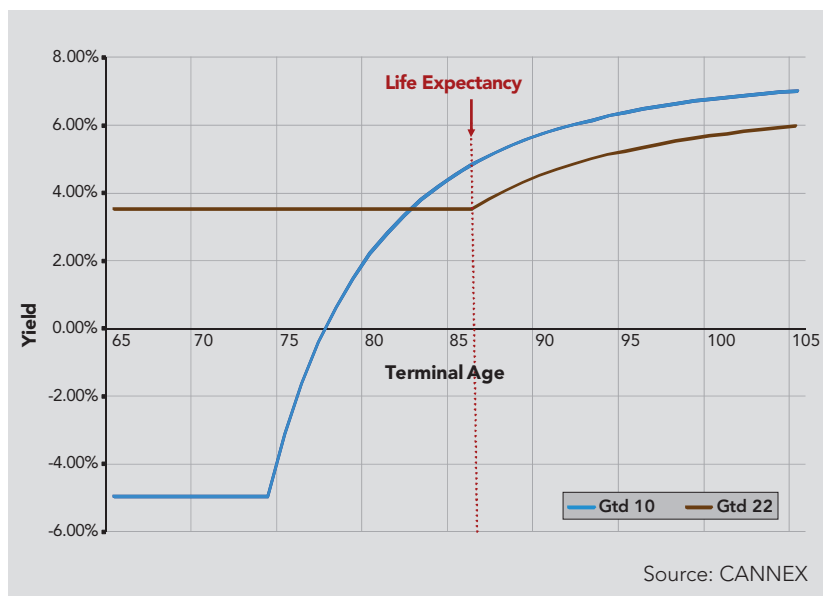
should purchase an income annuity with a long guarantee.

Graphing the result helps explain the yield from an income annuity, but it does not leave us with a satisfying result. That is because we may want to quantify the income annuity's yield to other investments which express yield as a single number.

We can solve this by taking a single point on the graph representing the average individual's life expectancy, which for a 65-year-old male is about 22 years. If an investor purchased a life annuity for a 65-year-old male with a 10-year certain period and the annuitant lived exactly 22 years, the investor would earn a yield of 4.8 percent.

Is this yield comparable to other investment vehicles with a similar risk profile? Not really — because very few people die at their life expectancy. Everyone has a 50 percent chance of dying before or after life expectancy. A central reason that people purchase life annuities is because they don't know how long they are going to live. They need to insure they have a source of income in the event that they live beyond life expectancy and to an old age.

If we want to compare the yield from a life annuity to other products, we can also analyze the problem in another way. There are two main reasons that investors purchase income annuities —



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to receive more income than would be available from other assets with similar risk profiles and to guarantee a monthly paycheck — no matter how long the annuitant lives. Let's focus on the latter.

Guaranteeing a paycheck for life involves pooling many annuitants, and this can only be done by an insurance company. If an investor would like the protection of a guaranteed paycheck for the rest of his life, he has limited choices. He can purchase a life annuity now or he can wait and purchase a life annuity when he's older. Based on CANNEX data, an investor that deposited \$100,000 in an income annuity for a 65-year-old male with a 10-year certain period could receive \$7,449.44 per year. If rates do not change, he could purchase the same stream of income (\$7,449.44/

year) when he's 75 years old for only \$73,590, which is 25 percent less. This is because he would have a shorter remaining lifespan.

Should he buy now or should he wait? We can answer this question if we can determine the yield required to generate the same income on the same schedule for 10 years and be left with enough money to purchase an income annuity at age 75. We define this yield to be the Implied Longevity Yield or ILY™. Calculating the ILY™ can be approximated by the yield of a series of cash flows, but a more precise answer requires some advanced calculus.

The ILY™ on this life annuity for a 65-year-old male with 10-year certain is 5.3 percent.

What does this tell us? The ILY™

provides a benchmark that an investor can use to compare an income annuity to other investments. If an investor that would like to receive guaranteed income for life can receive a better yield every year for 10 years from another investment with a similar risk profile (e.g., a highly rated bond with multiple levels of guarantees) he may want to wait to purchase the income annuity. However, if he cannot receive a better yield that is guaranteed every year from an investment with a similar risk profile, he should consider purchasing an income annuity now. **■**

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