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# How Much Alpha Do Clients Need in Retirement?

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**One way to determine a client's withdrawal rate is to calculate his minimum required alpha given his time horizon, assets, and income needs. Then you can decide which products to invest in and whether to apply an active or passive portfolio approach.**

As the boomer wave rolls into retirement, advisors become more and more receptive to learning about distribution planning. I have been speaking to groups of advisors at an increasing pace. I must admit, my topic—the mathematics of lifelong income—is not a cheerful subject. On the contrary, it can be depressing for many.

Recently an advisor asked me, "Are you are telling us that if your initial withdrawal rate is 6%, then the probability of running out of money in 30 years—even at optimum asset allocation—is over 80%? What if you were holding the best managed funds, the funds with the highest alpha?" Excellent question! Let's answer it.

## Understanding alpha

First of all, what is alpha? Alpha is a measure of how a portfolio performs against the market. In Wikipedia, alpha is defined as the "measure of the so-called excess return on an investment. It is a common measure of assessing an active manager's performance as it is the return in excess of a benchmark index."

To keep it simple, let's lump together all the factors that affect this excess return. The dividends received, proper diversification, and the manager's talent all increase alpha. Management fees, other charges, mismanagement, and bad luck decrease alpha. For example, say your benchmark is the S&P 500, and it returns 8% for the year. Your portfolio has a net return of 10% for the same year. In this case, your alpha is 2% including all dividends, expenses, fees, talent, luck, and, yes, stupidities for the entire year.

## Alpha at different withdrawal rates

Now that we know the definition of alpha, let's turn our attention to Robert J. Babyboomer. He has a certain amount of savings to finance his retirement. He needs to withdraw a certain amount of money from those savings. Our question is, What is the minimum alpha that this retiree needs for a lifelong income"

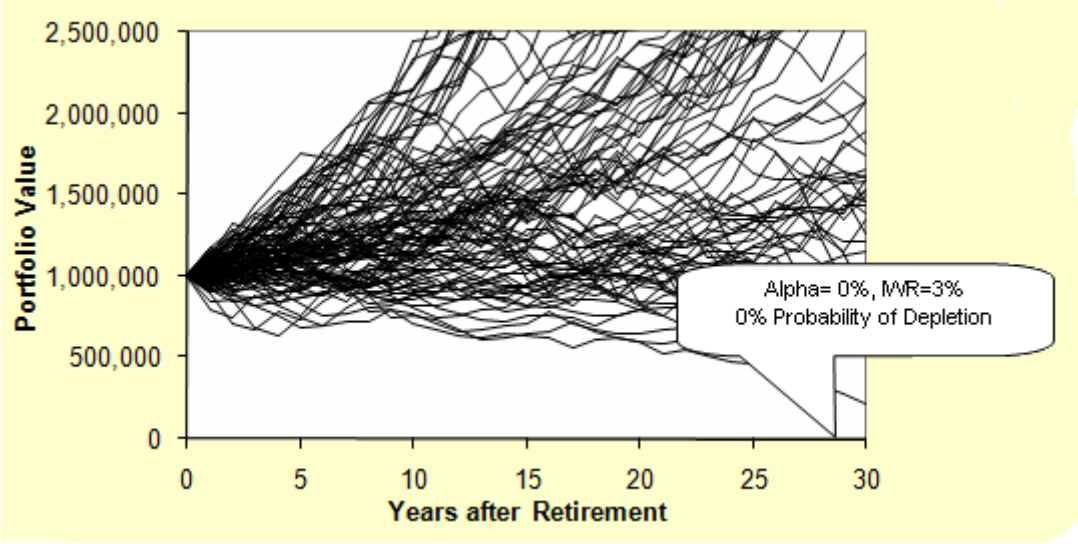
If the answer is zero, then all he needs to do is put his money into index funds and he should be OK. But if the answer is not zero, we have a problem. Over 80% of actively managed funds do not beat the index. The reality is, if Joe needs just a small amount of

income, index funds may be fine. But if he needs a large amount of income, fund selection becomes a critical issue for generating lifelong income.

A picture is worth 1,000 words. So let's work thorough an example visually. Bob, 65, is just retiring. He has $1 million in his portfolio. He needs $30,000 from his portfolio each year indexed to the CPI until the end of his life. This requires an initial withdrawal rate (IWR) of 3%. For planning purposes, we will use age 95 as age of death and an asset mix of 40% S&P 500 and 60% fixed income.

Figure 1 shows the potential outcomes of Bob's portfolio. Each thin black line shows the portfolio value if Bob were to start his retirement in any one of the years since 1900. By plotting each of these lines on the same chart, we generate a bird's-eye view of all outcomes. This type of a chart is called an aftcast—as opposed to a forecast, where you need to make assumptions about the portfolio's growth rate and inflation. Here, we have used actual market data—no assumed growth rate, no assumed inflation, and no Monte Carlo, thank you. Just historic data.

**Figure 1: The Aftcast of 3% IWR Since 1900**




*Source: Otar & Associates*

This chart shows us that if Bob had just the index return on his equity investments, he would have lifelong income. When he dies at age 95, he would leave a sizable estate (based on 108 years of market history) of somewhere between $200,000 and $6.8 million, depending on his luck. So, in addition to retirement planning, he'll also need to do estate planning and tax planning. Good news.

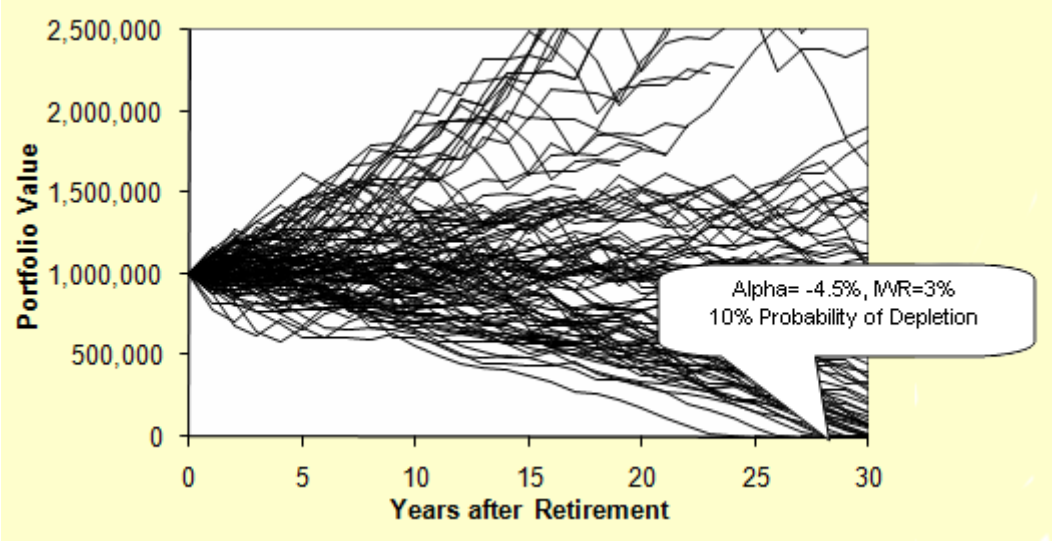
## Depletion risk

We can go a little further than that. For my retirement plans, I use a maximum of 10% probability of depletion at the age of death. That is my acceptable risk. At this risk level, if things don't work out as planned, there is still time to change strategy and create lifelong income. If you plan for a probability of depletion at the age of death that exceeds 10%, the risk can become unmanageable, causing irreversible damage.

My next step is to decrease the alpha until this risk level is reached. This alpha would then indicate how much the equity portion of Bob's portfolio can safely underperform the S&P 500 index. I know, I know, nobody wants to admit that they underperform the index. But the fact is that 80% of mutual funds underperform the index in the long term. And they are the professionals!

After running my calculator, the market history shows us that if Bob could have an alpha of -4.5%, he would still have lifelong income, as depicted in Figure 2. This is his minimum required alpha.

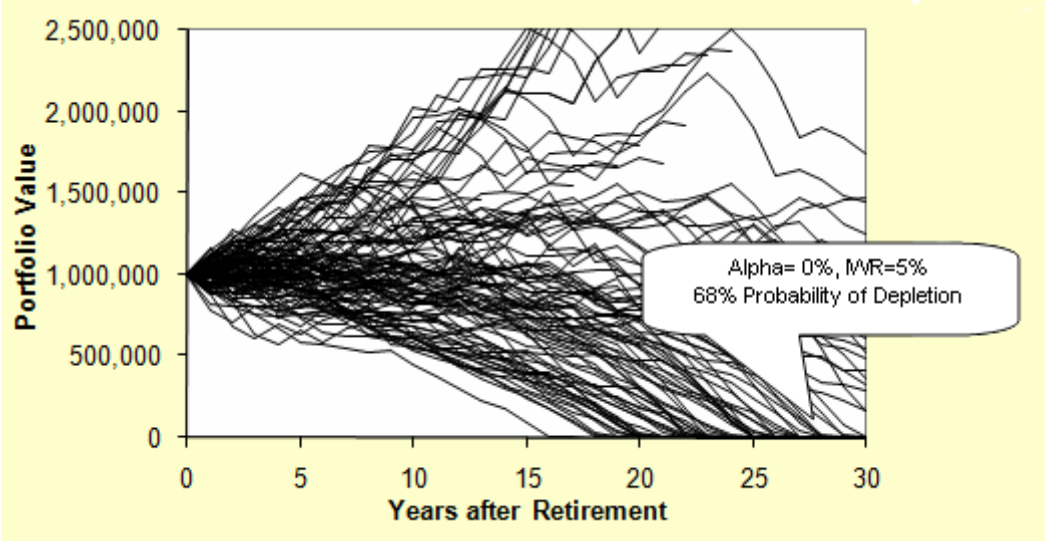
**Figure 2: The Aftcast of 3% IWR**
**Using Minimum Required Alpha (-4.5%)**




*Source: Otar & Associates*

In this example, Bob was lucky. He only needed $30,000 from his portfolio. Most of us need larger withdrawals. What if Bob needed $50,000 at age 65, indexed to the CPI annually until age 95? This is an initial withdrawal rate of 5%. Now the plot thickens.

**Figure 3: The Aftcast of 5% IWR since 1900**

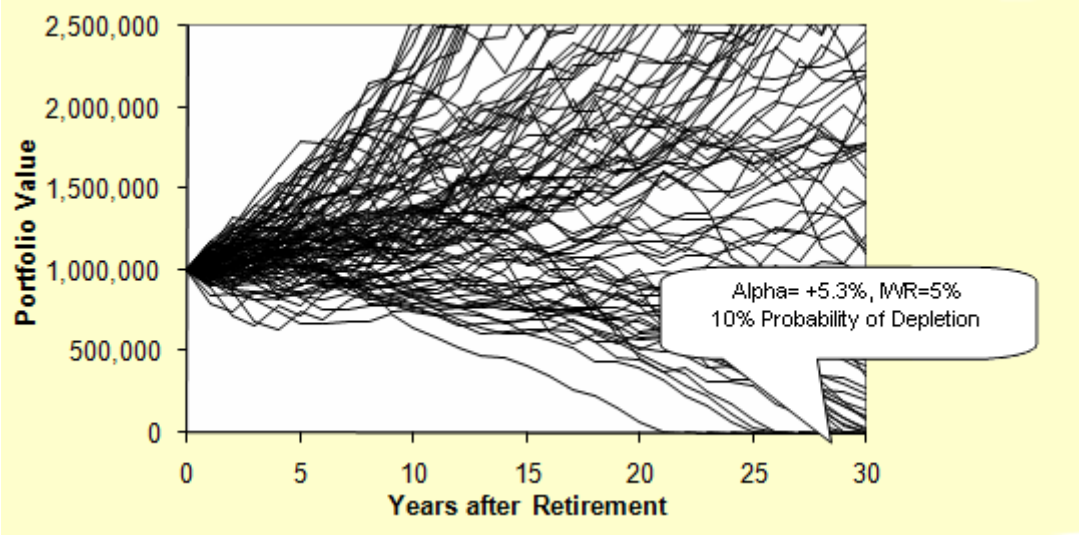



*Source: Otar & Associates*

Figure 3 depicts the outcome. The program tells me that the probability of depletion at age 95 is 68% based on market history. Not a pretty picture.

So we need a higher alpha to bring the risk down to an acceptable level: below 10% probability of running out of money at age 95. Just how much is it? A whopping 5.3%! Figure 4 depicts the aftcast of this since 1900.

**Figure 4: The Aftcast of 5% IWR**
**Using the Minimum Required Alpha (+5.3%)**




*Source: Otar & Associates*

Similarly, I calculated the minimum required alpha for various initial withdrawal rates and various time horizons. The table below shows the results:

**Table 1: Minimum Required Alpha for**
**Various Withdrawal Rates**

| | Retirement time horizon | | |
|---|---|---|---|
| | 20 years | 30 years | 40 years |
| Initial withdrawal rate | Minimum required alpha | | |
| 3% | -11.8% | -4.5% | -0.8% |
| 4% | -5.5% | +0.8% | +3.6% |
| 5% | +0.1% | +5.3% | +7.5% |
| 6% | +5.0% | +9.3% | +11.1% |

*Source: Otar & Associates*

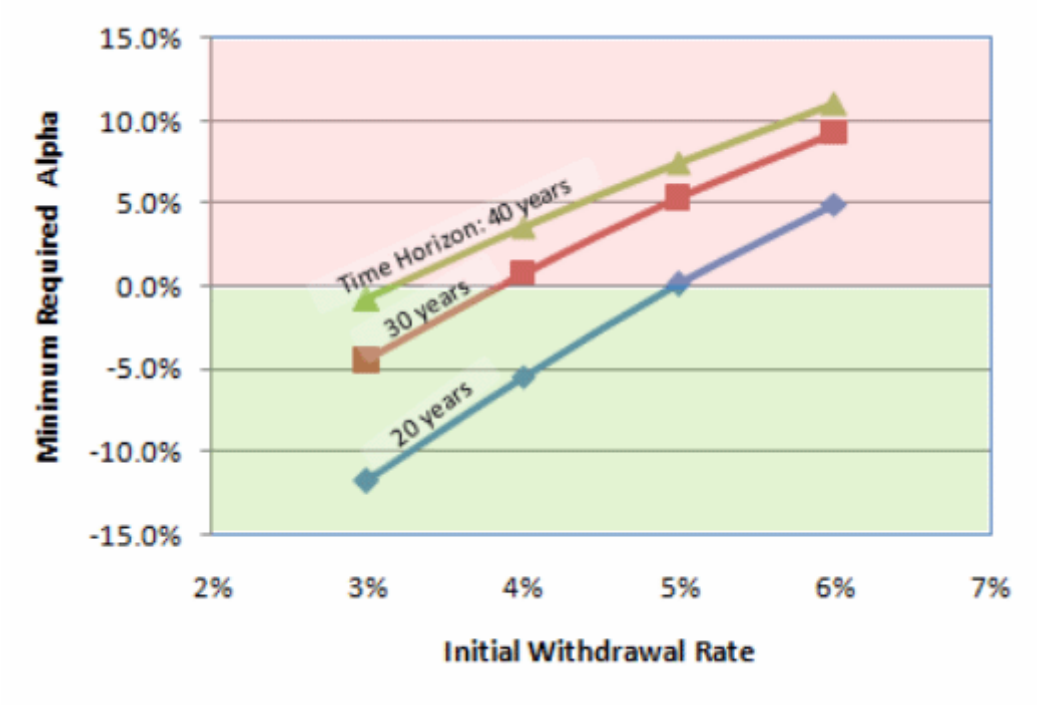
This table quantifies what most of us already knew:

- The higher the withdrawal rate, the higher the required alpha.
- The longer the time horizon, the higher the required alpha.

Figure 5 depicts this table in a visual format. We have two areas on this chart: The green area is where the minimum required alpha is less than zero. The pink area is where it is larger than zero. Here is how you can clearly and precisely make a decision about using index funds vs. actively managed funds in retirement portfolios:

- If the minimum required alpha is 0% or less, you can successfully use the index fund in your portfolio for lifelong income. For example, for a 30-year time horizon, if the initial withdrawal rate is less than about 3.8%, you use an index fund for a lifelong income.
- If the minimum required alpha is above 0%, index funds will not likely give you lifelong income. You need actively managed portfolios that can deliver this minimum alpha and nothing less. This tells me that once you are operating in this region, portfolio manager selection becomes a very important factor.

**Figure 5: Minimum Required Alpha for Various IWRs and Time Horizons**




*Source: Otar & Associates*

Going back to Bob's example, he wants 5% initial withdrawal rate for 30 years. For that, he needs to find a portfolio manager that can deliver an alpha of +5.3% for the next 30 years. If you can find a manager with a 5.3% alpha with a 30-year history, please let me know. The law of averages tells me that I'd be better off exporting the risk to an insurance company by buying a life annuity or variable annuity with lifelong payment guarantees at such high withdrawal rates.

## Incorporating beta

Let's finish this article by introducing another Greek letter: beta. It measures the volatility of a portfolio in relation to a benchmark. If beta is 1, the portfolio moves exactly the same as the benchmark. If it is 0.5, it has half of the volatility of the market. Using the same method, I calculated the effect of beta on the minimum required alpha. The following table shows the minimum required alpha for various initial withdrawal rates, time horizons, and betas:

**Table 2: Minimum Required Alpha for Various Betas, IWRs, and Time Horizons**

| | | Retirement time horizon | | |
|---|---|---|---|---|
| | | 20 years | 30 years | 40 years |
| Initial withdrawal rate | Beta | Minimum required alpha | | |
| 3% | 0.7 | -11.1% | -3.0% | +0.5% |
| | 1.0 | -11.8% | -4.5% | -0.8% |
| | 1.3 | -12.2% | -5.1% | -1.4% |
| 4% | 0.7 | -4.8% | +2.0% | +4.7% |
| | 1.0 | -5.5% | +0.8% | +3.6% |
| | 1.3 | -5.8% | +0.3% | +3.2% |
| 5% | 0.7 | +0.7% | +6.2% | +8.7% |
| | 1.0 | +0.1% | +5.3% | +7.5% |
| | 1.3 | -0.1% | +5.1% | +7.2% |
| 6% | 0.7 | +5.4% | +10.4% | +12.5% |
| | 1.0 | +5.0% | +9.3% | +11.1% |
| | 1.3 | +4.8% | +9.1% | +10.9% |

*Source: Otar & Associates*

There are three financial risks during retirement: the longevity risk (living too long), the market risk (running out of money), and the inflation risk (declining purchasing power). If you are attempting to self-insure your clients' retirement income against these risks, you now know what you are up against. Unless clients are filthy rich or incredibly lucky, it's better to pass these risks on to insurance companies. Your clients will have a more peaceful retirement. Life can be too agonizing if they have to depend on their children for help—or worse, move in with them.

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