The Secret Formula

There is an optimum asset mix for a retirement portfolio that works for almost all clients, regardless of risk tolerance—and here it is.

BY JIM OTAR

SECOND IN A THREE-PART SERIES

Strategic asset allocation involves establishing and maintaining a suitable mix of asset classes—usually cash, bonds and equities—in a portfolio. The first step is to establish the investor's risk tolerance, which is usually done in an interview with the client through a series of questions. The answers to these questions will place the client into one of the four or five risk categories. This is then declared as the "ideal" asset mix for that client, a volatility level that the investor can live with.

While this type of "personalized volatility threshold" works well for investment portfolios during wealth creation, it is often not the best solution for a retirement or income portfolio. In an income portfolio the objective is not necessarily to limit the volatility to a certain range but to provide a maximum portfolio life for a given withdrawal rate.

Going back 100 years, I ran several "what-if" scenarios. I used the following variables in my models:

- Initial withdrawal rate, between 3% and 10%. The IWR is defined as the withdrawal amount during the first year of retirement as a percentage of the value of the portfolio at the start of retirement. The withdrawal amount is adjusted each year for inflation, and the portfolio value fluctuates, but the IWR remains the same.
- Asset mix, between 0% and 100% of equity and fixed-income.
- The margin by which the equity portion of the portfolio outperformed the underlying index (Dow Jones Industrial Average), between +4% and -4%.

For each case, I prepared a "portfolio profile" chart that depicts the probability of depletion after five, 10, 15, 20, 25 and 30 years. The same chart also depicts the minimum and average portfolio life at different asset mixes. Figure 1 shows an example of a portfolio profile chart for all the years between 1900 and 1999 for a 3% IWR.

The upper chart in Figure 1 shows the probability of depletion on the vertical scale and the asset mix on the horizontal scale. We observe that the minimum probability of depletion occurs when the asset mix is 60% fixed-income and 40% equity.

Figure 1

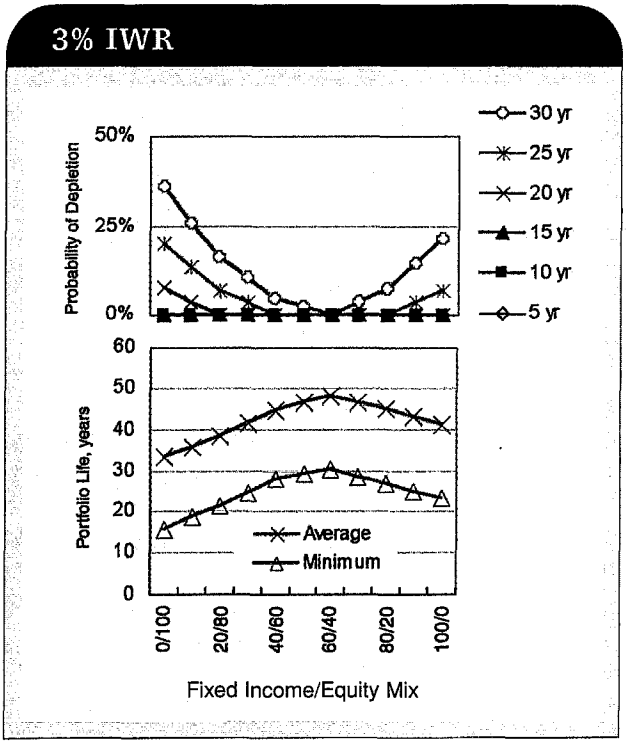
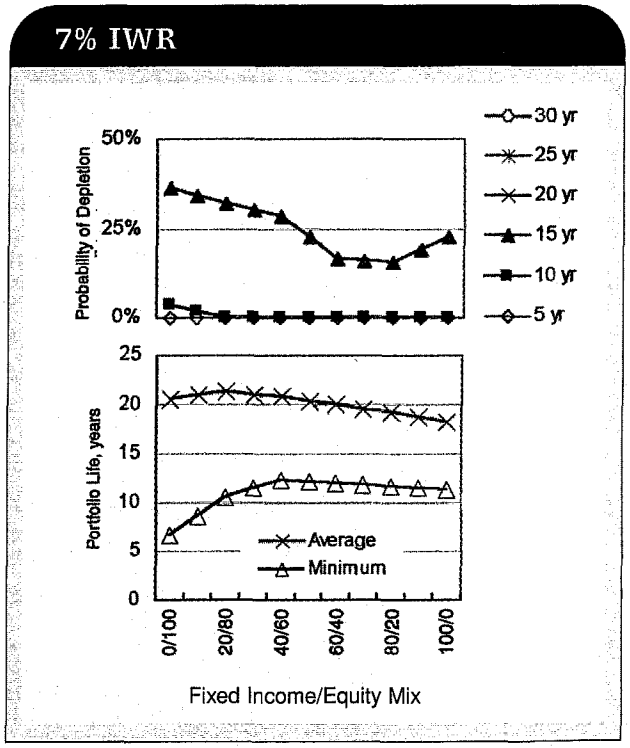


Figure 2



The lower chart shows the average and minimum portfolio life for each asset mix: Again, the 60/40 mix gives the longest average and highest minimum portfolio life in this particular case.

When we are optimizing the asset mix, our objective is twofold: We aim for the highest minimum portfolio life (because we don't want to go broke too soon) and the highest average portfolio life (because we want our portfolio to last as long as possible). One might expect that the highest minimum portfolio life always occurs at the same asset mix as the highest average portfolio life, as was the case in Figure 1. I found that this is only true at lower withdrawal rates. It is not the case at higher withdrawal rates. Here is why:

Because an all-equity portfolio has a higher volatility, it has a lower minimum portfolio life than an all-fixed-income portfolio. As fixed-income is added to an all-equity portfolio, at first both the minimum and average portfolio life increase. However, there comes a point at which adding more fixed-income increases the minimum portfolio life but decreases the average portfolio life. That is because while the fixed-income has less volatility, it has lesser probability of outperforming the equities over the long term.

Figure 2 shows an example of a portfolio profile for all the years between 1900 and 1999 for a 7% IWR. Notice how the average portfolio life peaks at 20/80 asset mix, the minimum portfolio life peaks at 40/60 asset mix and the minimum probability of depletion occurs at about 60/40 asset mix. The optimum asset allocation occurs at the combination of lowest probability of depletion, the highest average and the highest minimum portfolio life.

After analyzing numerous permutations and combinations, I arrived at the following rule of thumb: The optimum asset mix for a retirement portfolio is 60% fixed-income and 40% equities.

The exceptions to this rule are:

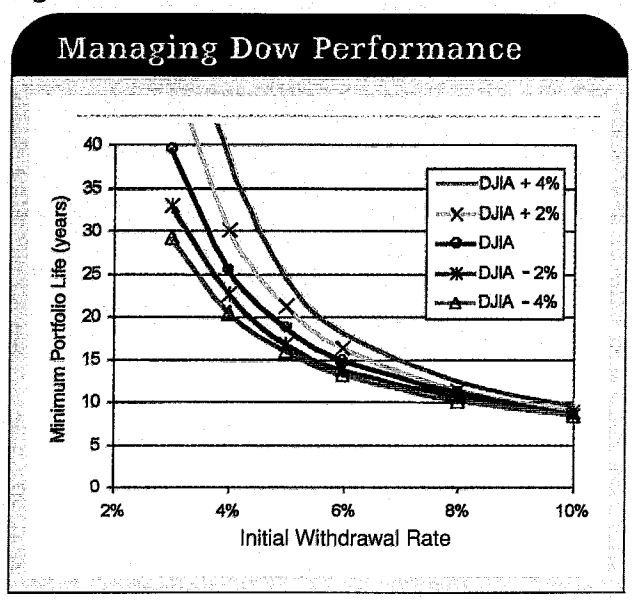
- If the IWR is higher than 8%, then the optimum asset mix is 80% fixed-income and 20% equities.
- If equities in the portfolio are underperforming the index by 3% or more, then the optimum asset mix is 80% fixed-income and 20% equities.
- If equities in the portfolio are outperforming the index by 4% or more and the IWR is 3% or less, then the optimum asset mix is 40% fixed-income and 60% equities.

The optimum asset allocation for an income portfolio has nothing to do with your client's risk tolerance, his investment knowledge or many other countless questions that your clients are forced to answer during your initial interview. Other than fulfilling the regulatory requirements, the ritual of the risk assessment has no significance to the optimum asset mix.

The fact is that, without knowing anything at all about your client except his or her initial withdrawal rate, an asset mix of 60% fixed-income and 40% equity with a 3% initial withdrawal rate would have lasted 43 years and three months, even if he or she happened to retire in the beginning of 1929. Remarkable, isn't it!

Conventional wisdom holds that annual rebalancing is a good thing because it reduces volatility. While that may be so for investment portfolios, it usually decreases the portfolio life if

Figure 3



you are making periodic withdrawals.

Last month's article discussed business cycles. Now we can apply our knowledge of cycles to optimize our rebalancing frequency. Some of the better-known business and market cycles are the 54-year Kondratieff cycle, the 18-year cycle, the 10-year decennial cycle, the four-year U.S. presidential cycle and the one-year seasonality cycle.

The first rule of rebalancing is that it reduces the volatility of cycles of smaller periodicity only. If you rebalance once a year, you are basically reducing the volatility of the one-year seasonality cycle in your portfolio.

The second rule of rebalancing for an income portfolio is that the optimum frequency depends only on two factors: The initial withdrawal rate and the relative performance of equities in the portfolio. Nothing else.

What is the best cycle to use? The first three cycles mentioned above (the 54-year, 18-year and 10-year) are too long for an average life expectancy after retirement. The U.S. presidential cycle is well within the time frame of any retirement projection, so that was my natural choice for optimization.

Between 1900 and 1999 the average annual growth of the Dow Jones Industrial Average was as follows:

	Average DJIA Growth
1st year of office	6%
2nd year	3%
3rd year	12%
Election year	10%

When I rebalanced income portfolios at the end of election years, most lasted longer and the probability of depletion was reduced.

Are there any situations when any rebalancing is actually "bad" for the portfolio life? Yes: When the IWR is low, it is better not to rebalance.

In the final analysis, my general guidelines for the optimum rebalancing frequency is:

- If the IWR is 3% or less, it is usually better not to rebalance at all.
- If the IWR is 7% or higher, then rebalance annually.
- Otherwise, rebalance once every four years at the end of the presidential election year.

These guidelines apply only to the optimum asset mix portfolios discussed earlier.

Even if you optimize the asset mix and rebalancing frequency, if withdrawals are unsustainable, your client will run out of money. It is our job as financial planners to give a realistic projection to our clients. This projection should not be based on how the markets did in the last couple of decades, but it should include a longer time period.

Based on all the years between 1900 and 1999 and the optimum asset mix and rebalancing frequency, Figure 3 depicts the minimum portfolio life as a function of the IWR and the equities in the portfolio performing at various levels relative to the Dow.

At higher withdrawal rates, it really does not make much difference how your equities perform relative to the index. At lower withdrawal rates, it makes a big difference. If your clients' IWR is 7% or less, then it pays to chase the best-managed mutual funds. Otherwise, you may want to save your time and energy by just recommending equity index funds.

The current withdrawal rate (CWR) is defined as the dollar amount of annual withdrawals during the preceding year divided by the current market value of the portfolio. Once the CWR exceeds 12%, then depletion of the portfolio is a certainty; nothing can prevent it from eventual exhaustion except reducing the withdrawal amounts drastically. There has never been a case to the contrary during the period from 1900 to 1999.

The charts in Figure 4 depict the remaining portfolio life (RPL). The vertical scale shows the RPL and the horizontal scale shows the CWR. Knowing the CWR, you can read off the range of RPL from this chart. The upper chart shows the RPL for an all-equity portfolio, and the lower chart for and all-fixed cash/fixed-income portfolio. The solid line on each chart shows the best fitting curve and the dashed lines show the

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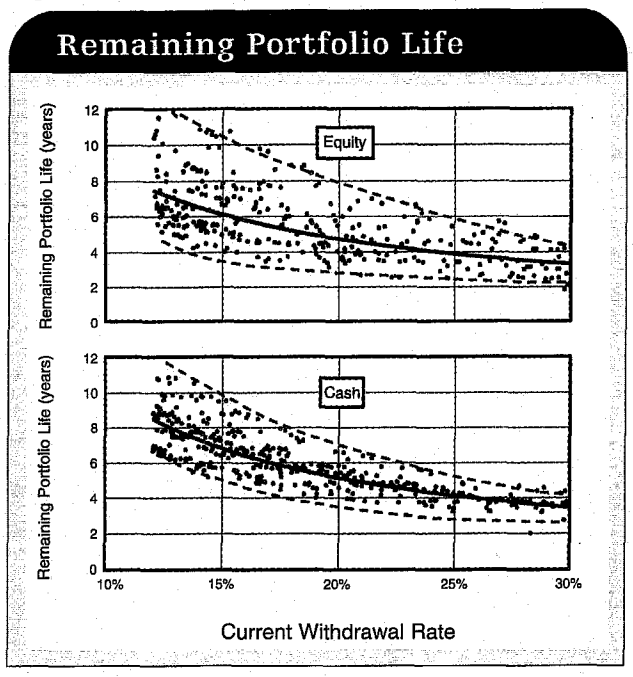
Figure 4



range of observations.

If CWR is known, you can use the following equation to estimate the RPL:

$$RPL, years = \frac{A}{CWR}$$

where A is:

- 100 for average remaining portfolio life.
- 150 for maximum remaining portfolio life.
- 75 for minimum remaining portfolio life.
- and CWR is larger than 12%.

For example, if the current withdrawal rate is 15%:

- Average RPL is: 6.7 years, calculated as 100/15.
- Maximum RPL is: 10 years, calculated as 150/15.
- Minimum RPL is: 5 years, calculated as 75/15.

When any of your clients' withdrawals become excessive, you might want to send them a letter making them aware of this critical situation, letting them know the maximum and minimum remaining portfolio life based on historic experience.

Because holding more fixed-income at higher withdrawal levels produces a more predictable outcome, I wanted to study the effect of switching to fixed-income in the final years of a portfolio. My first instinct was that doing so would protect the portfolio from further volatility of the equity market. I was hoping that this would result in a longer portfolio life.

In my models, I built an option to switch everything to fixed-income as soon as the current withdrawal rate exceeded a specified level. I experimented with 12%, 20%, 25% and 30%. I was surprised to see that in almost all cases, switching everything to cash shortened the portfolio life even more.

One possible explanation: Often the reason that the CWR jumped to excessive levels was because of a sharp drop in equity markets, not a higher income requirement by the client. If you then switched everything to the safety of fixed-income, you would lock in the losses and miss the subsequent rise in equities. So, the lesson was that even at excessive withdrawal rates, it was better to stick with the original asset mix, unless you look at other alternatives such as life annuity. **FP**

Next month: A look at three different methods of reducing the initial risk for clients who come in with a lump-sum investment for retirement.

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