Estimating Portfolio Life in Retirement: A New Technique

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Once clients are in retirement for five years, you can use this simple technique to discover whether their current spending habits will lead to a financial shortfall and make changes while there is still time.

Have you ever seen someone walking along the highway carrying a gas can? If you're driving an old car, the fuel gauge shows you how much of gasoline is in your tank. You look at it and make a rough guess about how far you can drive. If you are wrong and don't have a roadside assistance plan, then there is this dreaded walk of shame along the highway to the nearest gas station and back.

On newer models, the gas gauge shows not only how much fuel is left, but also how far one can drive. It is only approximate, but this is much more informative than looking only at the fuel level. Let's apply this analogy to answer our question, "What is my portfolio's life?"

This is how it works: We measure the impact of luck and other events on portfolio longevity after five years of withdrawals. This is a long enough time to establish client's "driving habits," in this case, "spending habits," as well as the impact of sequence of returns and inflation. We then make an estimate of how long this client can enjoy this ride.

First, we calculate growth of the retirement portfolio—in dollars—during the first five years of withdrawals. Then we add up all withdrawals during this same time period. Next, divide the portfolio growth by withdrawals and express this number in percentage. We call this the "Withdrawal Coverage," or WC for short. It incorporates all important factors that impact a portfolio's longevity. This is not an exact science but it is close enough to avoid the risk of "running out of gas" on the highway, or in this case, to avoid the risk of premature portfolio depletion.

Table 1: Impact of Events on Withdrawal Coverage

Event	Outcome	WC
Bad sequence of returns, bear market	Portfolio value goes down, reverse-dollar-cost-averaging, withdrawals deplete portfolio faster	WC is lower
Long-term bullish trend	Portfolio value goes up, impact of withdrawals become less significant, the impact of luck factor reduced	WC is higher
Higher inflation	Withdrawals go up	WC is lower
Expenses are higher than planned	Withdrawals go up	WC is lower
Expenses are lower than planned	Withdrawals are lower	WC is higher
Unexpected expenses	Expenses that are not covered by other sources, such as long-term-care expenses, critical illness and other similar lump-sum expenses	WC is lower
Unexpected reduced income from other sources	Reduction of income, such as premature death of one spouse which lowers the total CPP and OAS benefits, reduced pension income from pensions that are calculated based on market	WC is lower

	performance, health issues. They all increase required withdrawals from the retirement portfolio.	
Unexpected higher income	Unexpected annuities, royalties, other passive and active income	WC is higher
Unplanned windfall assets	Inheritance, lottery winnings	WC is higher

Source: Jim Otar

In the final analysis, the lower the WC is, the shorter the remaining portfolio life will be.

WC and the 4% withdrawal rate

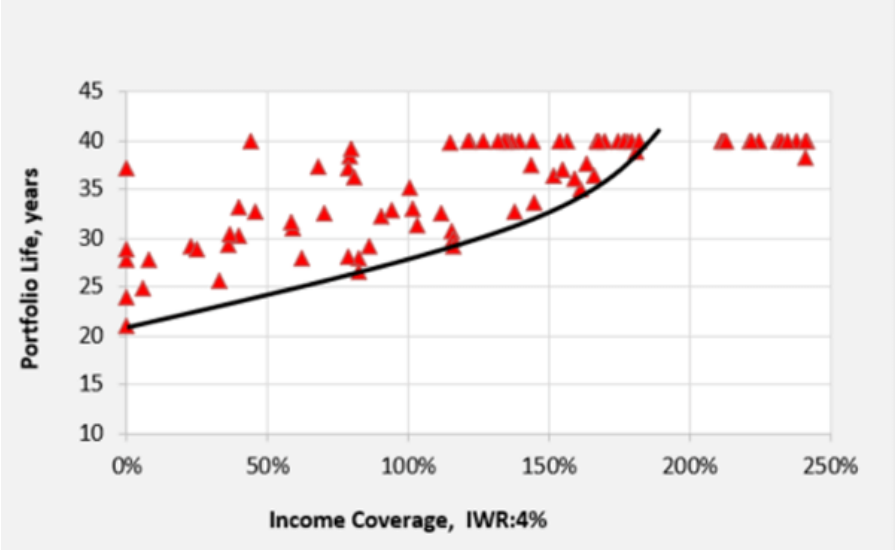
The popular assumption in current retirement planning practice is that a 4% initial withdrawal rate is sustainable for a typical 30-year retirement period. For example, if a retiree has $1 million at the start of his retirement and withdraws $40,000 from this portfolio in the first year (this is 4% initial withdrawal rate) adjusted annually for CPI, then his portfolio will last 30 years.

Let's see how WC works with this 4% safe withdrawal rate assumption. We calculate the WC for each starting year (of withdrawals) and its portfolio life between 1900 and 2000. Figure 1 depicts the portfolio life (vertical axis) as it relates to withdrawal rate (horizontal axis). Each plot point (red triangle) shows the outcome for a specific starting year between 1900 and 2000 for an initial withdrawal rate (IWR) of 4%.

The heavy black line on the graph indicates the worst-case (shortest) portfolio life. For the retiree, this is the "frontier" for the shortest historic portfolio life. The asset mix for this decumulation portfolio is 40% stocks and 60% fixed income. A more aggressive asset mix will push this frontier line lower, resulting in a shorter worst-case portfolio life.

What happens during the first five years of withdrawals, sets the tone for the client's portfolio longevity. WC reflects the impact of sequence of returns, inflation, client's withdrawal habits, impact of unexpected events and cash flow.

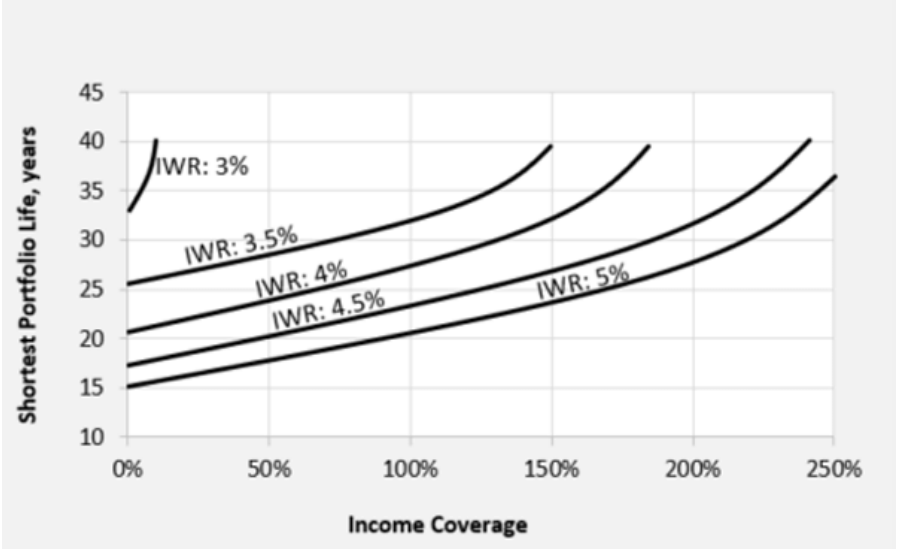
Figure 1: Portfolio Life vs. Percentage of Income Paid by Growth
During first 5 years; IWR: 4%



Source: Jim Otar

We do the same analysis for different initial withdrawal rates. Figure 2 depicts the frontier for the shortest portfolio life for different initial withdrawal rates.

Figure 2: Shortest Portfolio Life vs. Percentage of Income Paid by Growth



Source: Jim Otar

A sample case

Example

Bob retired five years ago at age 65 with $1 million in his portfolio. He needed $35,000/year then, subject to indexation for CPI for the rest of his life. This is an initial withdrawal rate of 3.5%. After withdrawing a total of $181,410 over the last five years, his portfolio is now worth $956,000.

That is all we need to know. Now we can calculate the worst-case portfolio life in two steps.

Step 1: Calculate WC

Looking at the table below, Bob's net investment is $818,590, calculated as the initial $1 million less his cumulative withdrawals of $181,410. The portfolio's net growth is $137,410, calculated as $956,000 (current market value) less $818,590 (his net investment). Therefore, growth during these five years covered about 76% of his cumulative withdrawals, calculated as $137,410 (net growth) divided by $181,410 (total withdrawals) expressed as a percentage.

Table 2: Calculating Bob's WC

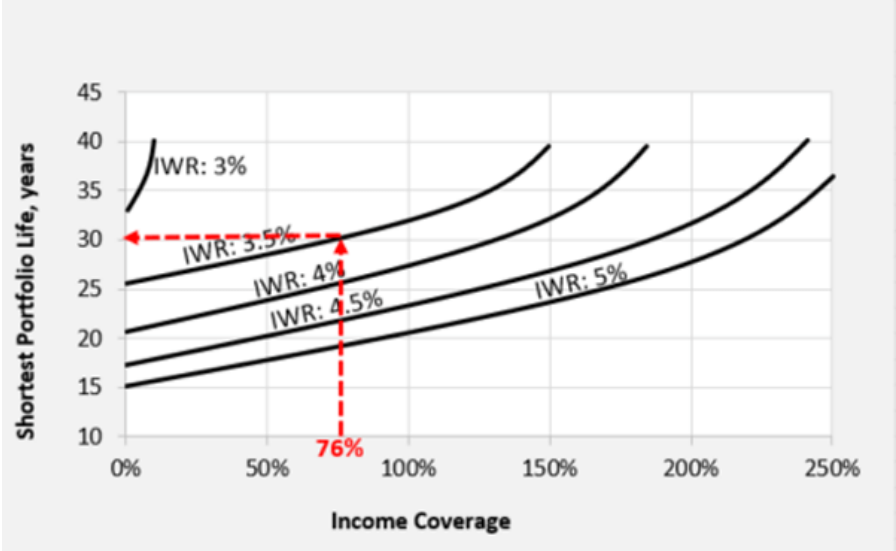
Current market value of portfolio		$956,000
Initial investment	$1,000,000	
Less cumulative withdrawals	$181,410	
Net invested	$818,590	
Less net invested		$818,590
Net growth		$137,410
Withdrawal Coverage		$\frac{\$137,410}{\$181,410}$ x 100% **WC = 75.7%**

Source: Jim Otar

Step 2: Look up the worst-case portfolio life on the graph

On Figure 3, draw a vertical line (red dashed line) starting at 76% on the horizontal axis until it meets the frontier for IWR of 3.5%. From there, draw a horizontal line until it meets the vertical axis on the left. Read portfolio life: Bob's portfolio should last 30 years in the worst-case, until age 95, calculated as 65 plus 30.

Figure 3: Estimating the Shortest Portfolio Life in the Example



Source: Jim Otar

What do you do if the worst-case portfolio life is shorter than what the client needs? Consider guaranteed income (annuities), reducing expenses (downsize home, reduce gifting, take fewer vacations), increasing income from other sources (rent the basement, do a side business, generate part-time income).

This simple technique enables you to discover a potential shortfall and make changes while there is still time. It is similar to a modern fuel gauge in your car telling you how far you can drive.

Keep in mind; the shortest portfolio life calculated here is based on the market history since 1900. Future outcomes can be different.

And interesting note, the author, who has retired from advising others professionally, developed this technique to see if there are any potential red flags in his own retirement plan!

Jim C. Otar is a retired financial planner and engineer. He is the founder of retirementoptimizer.com. His past articles on sequence of returns and the luck factor won the CFP Board Article Awards in 2001 and 2002. His latest book is *Advanced Retirement Income Planning* (2020). He retired from the business in 2018 and spends his time practicing creative writing.