



# RETIREMENT COUNSELING

## Four Warning Signals of a Retirement Portfolio's Demise



*Jim Otar, CFP, CMT, B.A.Sc., M.Eng*

When it comes to retirement income, there are three significant risk factors: longevity, market risk and inflation risk.

**Longevity risk** comes into the picture when a retiree lives “too long”. The mortality tables indicate the percentage of survivability for each age. When I enter an age of death in a retirement plan, I make sure that the probability of survivability does not exceed 15 percent at that age. This means I use 95 as the age of death in most retirement plans that I prepare.

**Market risk** is the probability of portfolio depletion by the age of death. I make sure

that it does not exceed 10 percent. Otherwise, irreversible calamities can happen. If the market risk is over 10 percent, even just marginally, an exponentially higher level of genius or luck is required to recover from even a routine correction.

**Inflation risk** refers to the ability of maintaining purchasing power. My limit is 10 percent, i.e. the purchasing power must stay above 90 percent of the requested amount.

A retirement plan must meet all these three criteria to be considered a well-designed plan. However, even after taking care of all these risk factors, there is one impediment for the success of a retirement plan: The “luck” factor. It contributes to over 60 percent of the success of a retirement plan<sup>1</sup> depending on your withdrawal rate.

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## Four Warning Signals

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Wouldn't it be nice to have warning signals for "bad luck"? Here are four warning signals that take luck into account.

### Warning Signal #1: Current Price Earnings Ratio

The Price-Earnings Ratio (PE) is one way of measuring the fair value of the stock market. If the average PE of all the stocks making up an index is high, then the markets are likely overvalued. If the average market PE is low then the markets are likely undervalued.

Is there a correlation between the current PE ratios and subsequent portfolio longevity? Yes, the prevailing PE has a great influence on portfolio life<sup>2</sup>.

First, I calculated the portfolio life<sup>3</sup> for each year of retirement since 1900 using my retirement calculator<sup>4</sup> that is based on actual market history.

Next, I calculated the Earnings Yield (EY) since 1900. The earnings yield is calculated as earnings divided by the stock price, the exact opposite of the PE.

After plotting the portfolio life and the earnings yield over time, I found there was a remarkable parallel between these two observations.

Based on these observations, I developed the following formulae to estimate the average life expectancy of a well-diversified retirement portfolio:

- Portfolio Life for a six percent initial withdrawal rate =  $4 + (250/PE)$
- Portfolio Life for a five percent initial withdrawal rate =  $4 + (360/PE)$

In these formulae, for better accuracy, use the average of the market PE of the most recent four years.

Here is an example: The PE ratio for the S&P 500 was:

Year	PE Ratio
2003	28.3
2004	20.3
2005	18.8
2006	17.1
Average	21.1

The expected approximate life of a well-diversified portfolio at 5 percent initial withdrawal rate, fully indexed to inflation, retiring at the end of June 2006, is:

Portfolio Life for five percent IWR =  $4 + (360/21.1) = 21$  years

This warning signal should be used only at the beginning of retirement. It gives an idea of expected portfolio longevity within an accuracy of four years. It will give you 12 to 30 years of advance notice.

If you do not like formulae and just want a simple rule of thumb, then here it is: If, at the start of retirement, the average market PE ratio is above 12.5 then expect a shorter portfolio life; less than 20 years. If, at the start of retirement, the average market PE ratio is below 12.5 then you might expect lifelong income at five percent or lower initial withdrawal rate.

### Warning Signal #2: The Fourth-Year Check-Up

I calculated the asset value of all portfolios over the entire retirement time period for each starting year since 1900. First, for each retirement year, I observed the portfolio value four years after the retirement: some were higher and some were lower when compared to its starting value. I separated these into two groups: winners (higher) and losers (lower). Next, I looked at each group after 20 years. The winners had a much higher survival rate than the losers.

Here are the numbers<sup>5</sup>:

Initial Withdrawal Rate	Is the portfolio value higher or lower on the 4th anniversary of retirement?	
	HIGHER	LOWER
	Probability of Depletion by 20th Year:	
5%	0%	7%
6%	2%	38%
8%	6%	72%

Here is how the fourth year check-up works: On the fourth anniversary of retirement, ask this: "Do I have more money or less money than four years ago?"

If you have more money, don't worry; be happy. On the other hand, if you have less money, the risk of running out of money during your lifetime is too high.

This warning signal will give you up to 20 years of advance notice.

### Warning Signal #3: Withdrawals Exceed the Sustainable Withdrawal Rate

If the current withdrawal rate exceeds the sustainable withdrawal rate then the retirement assets will likely expire before their owner. Here are the sustainable withdrawal rates for 90 percent portfolio survival rate:

Time Horizon	Optimum Asset Mix S&P 500/Fixed Income	Sustainable Withdrawal Rate for 90% Survival
20 years	30/70	5.1%
30 years	40/60	3.8%
40 years	40/60	3.2%

Example: Bob is 65 years of age, just retired. He has \$1 million in his portfolio. He needs \$48,000 each year, indexed to actual inflation. He wants his money to last until age 95. What are the chances?

Answer: Bob's time horizon is 30 years. His sustainable withdrawal rate for 90 percent survival is 3.8 percent, which is less than his withdrawal rate of 4.8 percent (\$48,000 is 4.8 percent of \$1 million). Therefore it is likely that he will be broke before age 95.

This warning signal will give you up to 15 to 25 years of advance notice.

### Warning Signal #4: The Final Warning Signal

I observed all portfolios with retirement starting in any one of the years since 1900, and plotted the current withdrawal rate against the remaining portfolio life.

Once the withdrawal rate exceeds 10 percent of the portfolio value, history shows that no retirement portfolio lasted more than 19 years.

The following formulae will give you a rough estimate of the maximum and minimum remaining portfolio life:

- Maximum Remaining Portfolio Life =  $160/\text{Current Withdrawal Rate}$
- Minimum Remaining Portfolio Life =  $80/\text{Current Withdrawal Rate}$

This warning signal will give you 8 to 18 years of advance notice.

### Conclusion:

Here you have four different and independently functioning warning signals that

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## Four Warning Signals

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will give you between eight and 30 years of advance notice. You may want to go over your client accounts and see if any of these warning signals apply. If so, make sure to have a discussion with your client. You will likely need to consider guaranteed income

classes such as life annuities or variable annuities, either with guaranteed withdrawal or guaranteed income benefits. The most important objective in retirement planning is preventing nightmares and not selling dreams. These warning signals may help you achieve this objective.

Keep in mind; these findings are based on market extremes of the last century. The current century may create market extremes beyond that and future outcomes may be different. ●

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- (1) Otar, Jim "A Matter of Luck", Financial Planning, February 2005.
- (2) Otar, Jim "Can the Prevailing PE be a Good Predictor of the Portfolio Longevity", IMCA Monitor, December 2007.
- (3) The retirement portfolio starts with \$1 million, invested 40 percent in the S&P 500 and 60 percent in fixed income accounts. The withdrawal in the first year is \$60,000, indexed to inflation in subsequent years. Thus, the initial withdrawal rate (IWR) is six percent, calculated as \$60,000 as a percentage of \$1 million. On the equity side, I used the prevailing dividend rate of two percent. As for the management costs, I assumed 1.5 percent for the equity holdings and 1.0 percent for the fixed income holdings. To smoothen the fluctuations of the portfolio life within the average market cycle, I took the four-year moving average of the portfolio life.
- (4) Otar Retirement Calculator.
- (5) For the asset mix of 40 percent DJIA and 60 percent fixed income.