PENSION TRENDS
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The Life Expectancy Shell Game

Planning your retirement savings needs based on living to an average life expectancy after you retire is a lousy bet, even by Las Vegas standards. It is much more likely you will live significantly longer than or shorter than the life expectancy the actuarial tables define as "average".

In the classic shell game, a con man called an operator places a small soft ball called a pea on a flat surface, and then moves the ball back and forth rapidly under three shells. When he is done, your job is to guess which shell the pea is under. Unfortunately for you, the operator is skilled at sleight of hand. Undetected by you, the pea will end up under the shell of his choice. There is no way you can win. You have been conned and the money you laid on the table is gone. You made a lousy bet.

Betting your retirement savings that you will live to an average life expectancy for someone your age and gender is also a lousy bet. If we use the three shell analogy to define your life expectancy possibilities – dying earlier than the life expectancy tables indicate, dying close to an average expectancy, or outliving an average life expectancy–don't look for the *your* life expectancy pea to be under the average life expectancy shell. Odds are it is under one of the other two shells.

In fact, predicting *your* life expectancy is very much like playing the classic shell game. There is no way you can know under which of the three life expectancy shells *your* life expectancy will end up. All that can be predicted with any degree of reliability is the life expectancy of a "typical" member of a particular demographic group (e.g. - an American male in a blue collar profession, or a disabled American female). An individual's life expectancy cannot be known or predicted with any degree of reliability.

"Average" Life Expectancy

According to standard mortality tables, a typical American male age 66 (M66) can expect to live to about age 86 (the probability of survival to that age is about 50%) and a typical American female age 66 (F66) to about age 88.[1] In other words, M66 has a life expectancy of about 20 years, and F66 has a life expectancy of about 22 years. Based on these statistics, many financial planners would advise you to plan on your retirement savings needing to last about 20 or 22 years. Unfortunately, that turns out to be very bad advice.

What are the odds our typical American male and female retiring at age 66 will die at our near their life expectancy? Answer: Very small. The odds M66 will die at age 86 is only about 4.0%; the same is true of the odds of F66 dying at age 88. In other words, **there is about a 96% probability M66 and F66 will each die earlier or later than their respective life expectancy.**

Let's broaden our definition of "average" life expectancy to mean death within three years one side or the other of the exact age of life expectancy. (After all, a one-year window for defining average is pretty narrow.) For M66 that means he would achieve an average life expectancy if he died anywhere between ages 83 and 89. For F66, the range of average life expectancy would be between ages 85 and 91.

What are the odds M66 and F66 will die within this expanded definition of average life expectancy? Answer: Still not a good bet. For M66, the probability of death between ages 83 and 89 is only about 27%; again, the same is true of F66 dying between ages 85 and 91. **In other words, if M66 was managing his retirement finances in anticipation of it lasting somewhere between 17 and 23 years (not an easy task in and of itself) there is a 73% probability he was either more frugal than he needed to be or he ran out of money**.

Are you ready to bet your financial security in retirement that you will die somewhere near your life expectancy even though the odds are about 3 to 1 *against* that happening? Most of us would answer that question no, yet almost all retirement planning calculators use average life expectancy as the foundation for planning your financial security.

Joint Life Expectancies

Now let's suppose M66 and F66 are married. Like most things in life, being married complicates one's situation. What matters is not M66 and F66's individual life expectancies, but rather their joint life expectancy. Their joint life expectancy is the likelihood that either of them is still alive. After all, as long as one of them is still alive there is still a need for retirement income.

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As we already noted, M66 has about a 20-year life expectancy and F66 about a 22-year life expectancy. However, their joint life expectancy is 26 years, when one, the other, or both are age 92. It is longer than F66's life expectancy because there is a chance M66 will outlive her, even though he is not, on average, expected to do so. In fact, according to the life expectancy tables, there's about a 35% chance one of them will still be alive at age 95, and about a 13% probability that one of them will still be alive at 100!

Your Life Expectancy

Unfortunately, none of these probabilities, none of these average life expectancies are a reliable predictor of *your* future lifetime, or ours. The only life expectancy statement that is absolutely accurate, albeit absolutely worthless, is that if you are reading this you have not yet reached the end of your lifetime. But whether that end will come tomorrow or 50 years from now is not knowable.

Certainly there are factors that can help predict the *likelihood* of your living to a future age, but only the likelihood. Heredity and lifestyle are two that come immediately to mind. There are many scientific studies documenting the fact that individuals who lead healthy lifestyles, with exercise and good eating habits, have longer life expectancies than do sedentary smokers.[2] But again, these are only averages, only general expectations.

To cite just two examples, not only was Winston Churchill well known for having a cigar constantly in his mouth, his rotund figure is obvious in the many photos of him with other world leaders taken during World War II. Yet Winston lived to the ripe old age of 90 at a time when life expectancies were much less than they are today. At the other end of the spectrum is Jim Fixx, a man to whom running and healthy lifestyle became almost a religion, and who died at age 45 from congestive heart failure.

The Probability of Ruin

> You count yourself lucky that you and your spouse are both still alive and in relatively good health at age 89, but you have only $1,800 left in your IRA, and $1,580 per month coming in from Social Security. Maybe you have no mortgage but you still have fixed expenses like property taxes and insurance, Medicare supplemental insurance premiums, heat, electricity, and other utilities, plus necessities like food, clothing, gas and other transportation costs, house repairs, upkeep, and medical co-pays, not to mention such "luxuries" as cable television, and a few days at the coast now and again. The outlook for the next who knows how many years appears bleak. "If we had been more judicious with our retirement savings, maybe we could have avoided financial ruin."

Not only is it impossible for someone entering into their retirement years to reliably predict their life expectancy, banking on a wrong prediction can have devastating consequences. What do you do, where do you turn if you outlive your retirement savings? Perhaps this question more than any other creates the greatest fear for people entering into their retirement years.

The actuarial term that describes this situation is the probability of ruin: The probability of an outcome that has potentially ruinous results. A casualty insurance company might know that the probability of another Hurricane Katrina is very, very small, but the result of another Katrina would be ruinous for the insurer if it has too much exposure in the Gulf Coast region. Rather than deal with even a remote probability of ruin, the prudent insurer will limit its exposure in the Gulf Coast region by spreading its exposure among diverse geographical areas.

As with the insurance company, the prudent decision for the new retiree would be to avoid any probability of ruin. Since there is no way to reliably predict under which life shell your life expectancy pea will be found, is there a rate at which a retiree can draw down their retirement savings with assurance that the withdrawals will not deplete their savings?

The most commonly quoted rate is 3% or 4% per year.[3] We will analyze the reasonableness of this assumed safe withdrawal rate in the second part of this paper, but assume for the moment that a 3% withdrawal rate is a "safe" rate. You will not outlive your retirement savings if you withdraw no more than 3% of your savings each year. Regardless of what your life expectancy turns out to be, applying a 3% withdrawal rate will avoid any probability of ruin.

Does this solve your life expectancy dilemma? Have you found a way to totally avoid playing the life expectancy shell game? Our answer is probably not. We will explain why in Part 2 of this paper, "Planning for the Unknowable."

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[1]Age 66 is used because it is the first age at which anyone retiring by the year 2020 can qualify for unreduced social security benefits. See Table at end of article.

[2]For an example of this and for other longevity illustrations, see the excellent interactive Actuaries Longevity Illustrator, maintained jointly by the Society of Actuaries and the American Academy of Actuaries.

[3]For example, see 7 Rules of Thumb for Retirement Planning by Robert Berger for US News & World Report, August 2, 2013.

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Probability of Survival for Individuals Age 66

Age	M66	F66	Age	M66	F66	Age	M66	F66
66	100.0%	100.0%	82	64.8%	71.4%	98	8.2%	13.3%
67	98.6%	98.9%	83	61.4%	68.4%	99	6.3%	10.7%
68	97.1%	97.8%	84	57.8%	65.2%	100	4.8%	8.4%
69	95.6%	96.6%	85	54.1%	61.9%	101	3.5%	6.4%
70	94.0%	95.3%	86	**50.3%**	58.3%	102	2.5%	4.8%
71	92.2%	93.9%	87	46.3%	54.6%	103	1.8%	3.5%
72	90.4%	92.5%	88	42.2%	**50.8%**	104	1.2%	2.5%
73	88.5%	90.9%	89	38.1%	46.8%	105	0.8%	1.7%
74	86.4%	89.3%	90	34.0%	42.7%	106	0.5%	1.2%
75	84.2%	87.5%	91	30.0%	38.6%	107	0.3%	0.8%
76	81.9%	85.6%	92	26.0%	34.5%	108	0.2%	0.5%
77	79.4%	83.6%	93	22.3%	30.5%	109	0.1%	0.3%
78	76.8%	81.5%	94	18.8%	26.6%	110	0.1%	0.2%
79	74.1%	79.2%	95	15.7%	22.9%	111	0.0%	0.1%
80	71.2%	76.8%	96	12.9%	19.4%	112	0.0%	0.1%
81	68.1%	74.2%	97	10.4%	16.2%	113	0.0%	0.0%

Based on the Society of Actuaries' Pension Plan Mortality Table (RP-2014) and Mortality Improvement Scale (MP-2015).