

Supplement to Issue Brief Series: Major risks in retirement



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An effective retirement strategy needs to strike the right balance among the major risks in retirement.

The planning horizon for a retirement portfolio is inherently uncertain.

Introduction

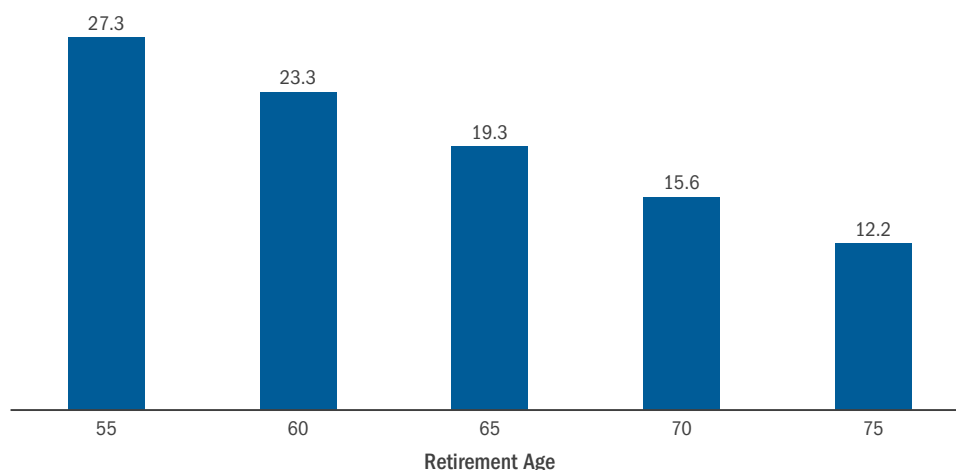
From a financial planning perspective, individuals face numerous financial risks throughout their lives. During a person's working years, some of these risks can be mitigated simply by choosing to continue working. However, once an individual retires that option is no longer available and the retiree will need to have a strategy to manage these risks.

In this paper we will discuss the major risks in retirement that impact all individuals. These include longevity risk, inflation risk, interest rate risk, stock market risk and sequence of returns risk. Unfortunately trying to reduce one risk usually leads to an increase in exposure to another. The most effective retirement strategy will involve striking the right balance among each of the key risks. Hopefully by better understanding these risks, better solutions can be created and better outcomes achieved.

Longevity risk

One of the biggest risks that retirees face is longevity risk, which is the risk of outliving one's money. Nobody knows exactly when they will die, so they do not know how many years their retirement nest egg needs to last. In other words, from an investment perspective the planning horizon is uncertain.

Chart 1 – Life expectancy (in years) at different ages



Source: CDC National Vital Statistics Report, June 30, 2016 (Males and Females Combined)

Chart 1 above shows the life expectancy at different retirement ages. Life expectancy simply means the average number of years that a person can expect to live given a certain starting age. For example, a person who retires at age 60 can expect to live about 23.3 more years, and a person age 65 can expect to live 19.3 more years. Knowing the life expectancy for different ages can be very useful from a planning perspective.

However, the planning horizon should not be set equal to the life expectancy but rather, to a period that is longer than life expectancy. This is because the life expectancy is just an average for a large population. At the individual level, half will die before life expectancy and half will die after life expectancy. With improved health care and medical advances, life expectancy has been steadily increasing over the years with many people living to age 90 or even 100. Moreover, the oldest fully authenticated age to which any human has ever lived is age 122.

The statistics provided in Chart 1 are for both males and females combined. In viewing the life expectancy of males and females separately, females on average can be expected to live a few years longer than males. According to the Society of Actuaries, about one out of three males and about one out of two females who are in their mid-50s today will live to be 90.¹

How can individuals address longevity risk?

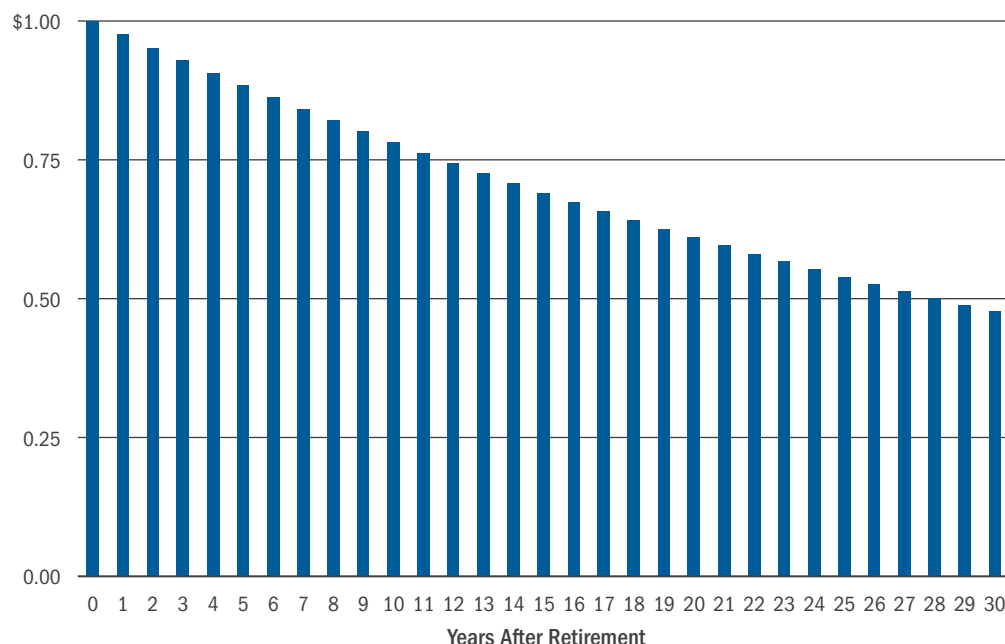
Guaranteed lifetime income is an effective way to mitigate longevity risk. Social Security is the most common form of guaranteed lifetime income for Americans. However, Social Security is typically not adequate to cover a retiree's annual expense needs, as it only covers about 40% of the average worker's income, according to the SSA website.² Pension or annuity income can provide guaranteed lifetime income that can supplement Social Security. However, the use of annuities does involve some trade-offs, such as losing control of some assets and possibly leaving less money to heirs.

Inflation risk

Another major risk that retirees are exposed to is inflation risk. This is the risk that the purchasing power of a dollar today will be steadily eroded over time by inflation, such that it will be able to purchase significantly less in the future. Chart 2a below shows the value of a dollar over time assuming a constant inflation rate of 2.5% per year. We see that after 28 years, the value of a dollar is cut in half.

Inflation erodes
purchasing power

Chart 2a – Value of \$1 over time with 2.5% inflation each year



How can individuals address inflation risk?

The most effective way to mitigate inflation risk is to own assets that have the potential to grow along with or faster than inflation, such as stocks. Historically, the returns on stocks have increased more rapidly than inflation. But in the short term, stocks are very volatile and provide no guarantees that they will increase with inflation or at all. In other words, the purchase of stocks will involve a trade-off between inflation risk and stock market risk. *Keep in mind that it is possible to lose money when investing. Past performance does not guarantee future results.*

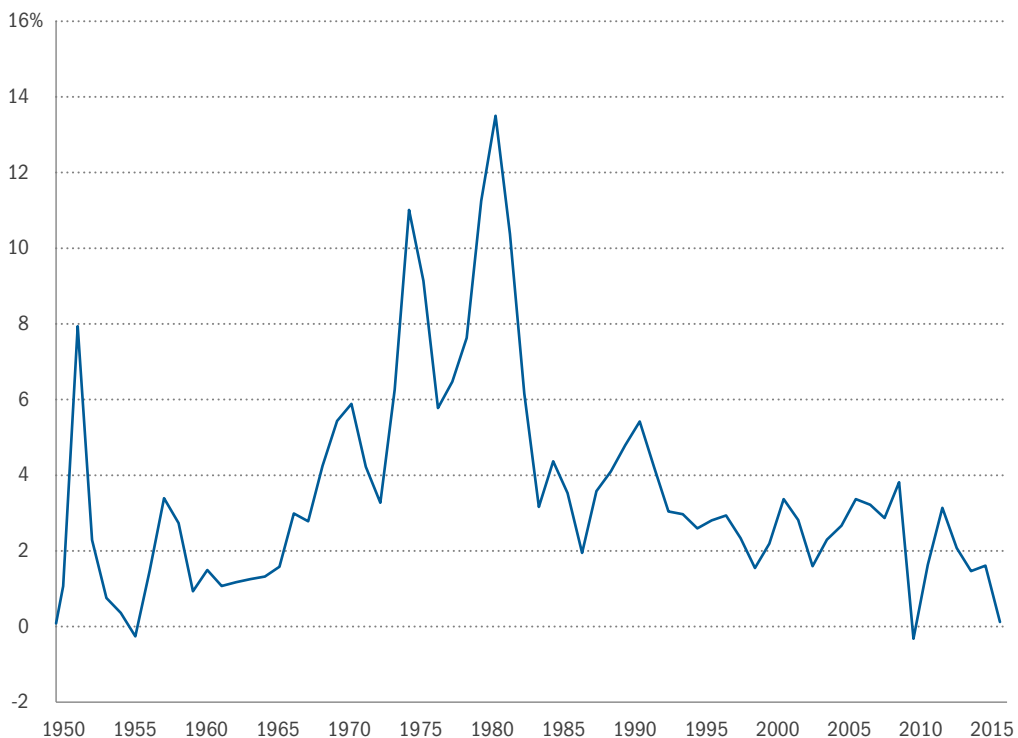
It should be noted that although Social Security may provide cost-of-living increases that keep pace with inflation, guaranteed lifetime income from a pension or fixed annuity generally does not. For this reason, the use of a variable income annuity, whose annuity income is tied to equity performance, should also be considered to help mitigate inflation risk. However, this strategy should be done in a measured way as it will also lead to an increase in stock market risk.

Historical inflation

For a historical perspective on the level of inflation, Chart 2b below shows the annual inflation rates from 1950 to 2015. There was a period of very high inflation in the 1970s and 1980s. However, since the early 1990s, inflation has been kept at a more manageable level and has remained under 4% each year.

Chart 2b – Annual inflation rates from 1950 to 2015

Inflation has been relatively low in recent years but reached to more than 10% in the 1970s and 1980s



Source: Federal Reserve Economic Data (FRED)

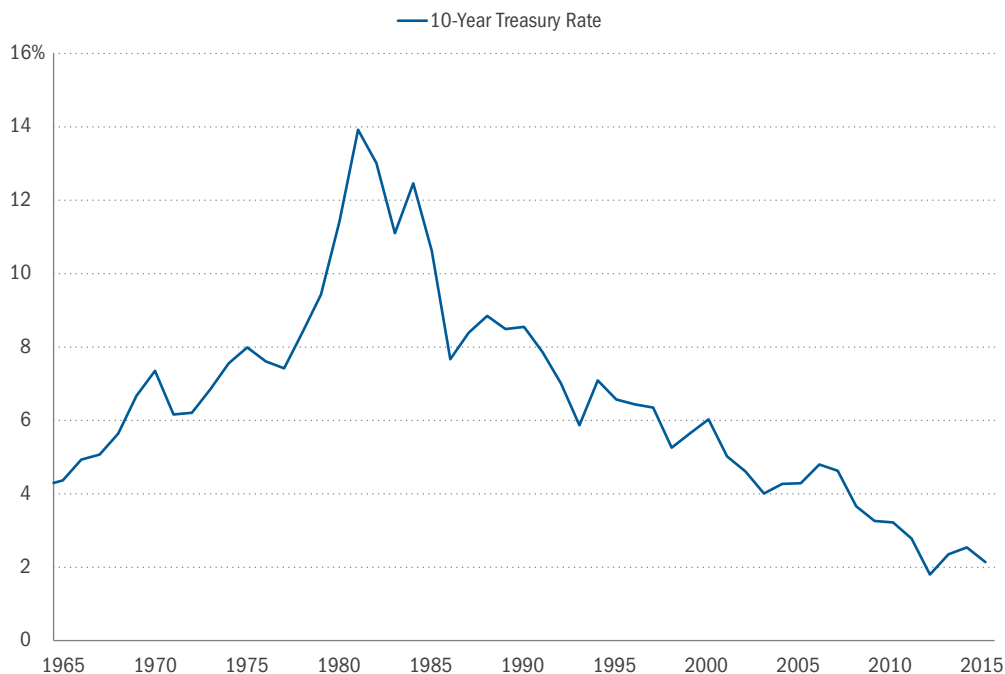
Interest rate risk

A major risk of which many current retirees are probably very well aware is interest rate risk. In the past, when interest rates were very high, many retirees could simply live off the interest from fixed-income investments. However, in today's extremely low interest rate environment, this is virtually impossible, except for those with an enormous amount of wealth. Chart 3 below shows 10-year Treasury rates since 1965. We can see that the current level of rates is historically very low.

When interest rates decline, this does have the positive effect of increasing the value of existing bonds. However, whenever interest rates increase, this will have the negative impact of decreasing the value of existing bonds and other fixed-income investments.

Low interest rates make it difficult for retirees to live off of the interest from fixed income investments

Chart 3 – Historical interest rates from 1965 to 2015



Source: Federal Reserve Economic Data (FRED)

How can individuals address interest rate risk?

One way to mitigate (but not eliminate) the risk of changes in the level of interest rates is to convert a portion of a retiree's account value into a stream of guaranteed lifetime income payments—for example, through a fixed annuity. Unfortunately, fixed annuity income generally does not keep pace with inflation, so although this can reduce interest rate risk, it will still carry some inflation risk.

Another way to mitigate the risk of low interest rates at the point of retirement is to invest over time, prior to retirement, during different interest rate environments, using vehicles that lock in rates—for example, guaranteed products or through a buy and hold strategy using individual bonds.

Stock market risk

With the 2008 Financial Crisis still lingering firmly in many investors' minds, stock market risk is clearly a major risk faced by retirees. This risk is more acute for retirees than for those who are still working. Since it may take many years to potentially recover from stock market losses, a retiree who needs income may have to sell at depressed prices. Keep in mind that mathematically, after a 50% loss, it will require a gain of 100% just to get back to where one started. For example, if an asset starts at \$100,000 in value and suffers a 50% drop, its value is reduced to \$50,000—in order for it to get back to where it started, it would need to double in value from \$50,000 to \$100,000 which is equal to a 100% gain.

Chart 4 below shows historical return statistics³ for stocks, bonds and Treasury bills. Clearly stocks have had the highest average annual returns. However, the volatility of returns needs to be considered by investors as well. The typical measurement of volatility is the standard deviation of historical returns. Also shown in Chart 4 is the range of outcomes calculated as the average return plus/minus one standard deviation. Under a normal distribution it would be expected that a majority of annual returns (about 2/3) fall within this range. Even though the upper part of this range for stocks is pretty impressive at 31.9%, the lower part may be of more concern at -8.0%. In other words, retirees invested in stocks should expect to experience both upswings and significant downturns over the years.

The range of outcomes from investments needs to be considered, not just the average.

Chart 4 – Historical returns from 1926 to 2015

Statistic	Treasury Bills	Bonds	Stocks
Average Annual Return	3.5%	6.0%	11.9%
Standard Deviation	3.1%	10.0%	20.0%
Worst Year	0.0%	-14.9%	-43.3%
Best Year	14.7%	40.4%	54.0%
Range: Average +/- One Std Dev	0.3% to 6.6%	-3.9% to 16.0%	-8.0% to 31.9%

Source: Morningstar S&P 500 (Stocks, Bonds, Bills, and Inflation) Data
Past performance does not guarantee future results.

How can individuals address stock market risk?

The best way to help mitigate stock market risk is to limit the equity exposure to a level that the retiree can tolerate. Unfortunately, reducing stock market risk and investing in other asset classes will likely carry with it some of the other risks mentioned earlier, such as longevity, inflation or interest rate risk.

Sequence of returns risk

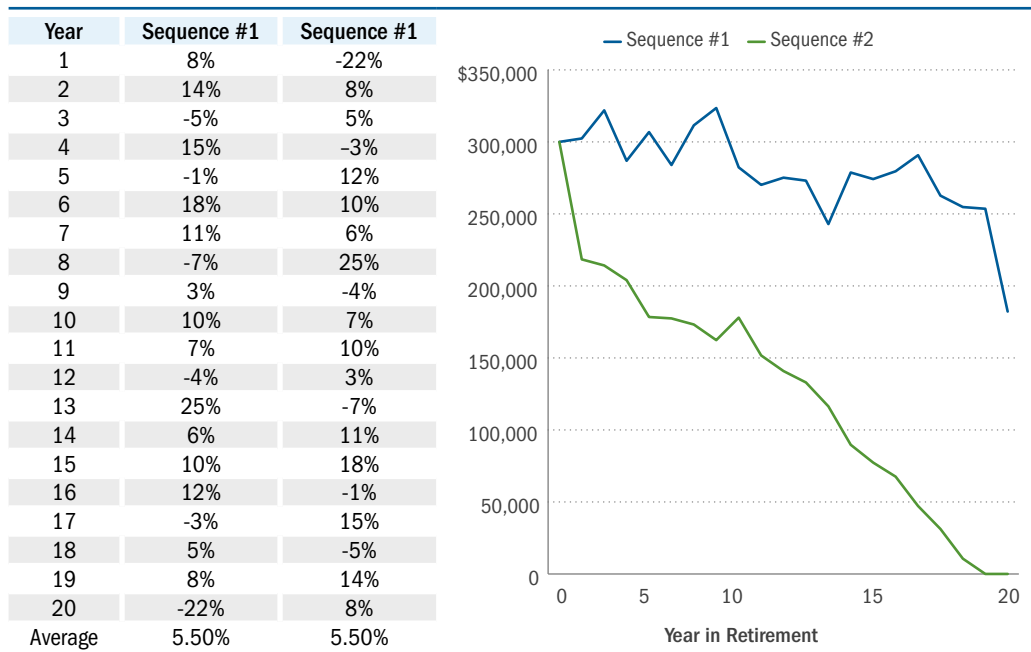
The last major risk that we will discuss is closely related to stock market risk but is slightly different. This is sequence of returns risk. This risk does not exist for an investment portfolio in the accumulation phase, but rather exists only for a portfolio with periodic withdrawals which occur during an individual's retirement phase. With sequence of returns risk, even if the average return on investments is identical for two different retirees, if the order of when those returns occur is different, the outcomes can be very different. In particular, an individual who faces a large loss soon after retirement will have a worse outcome than an individual facing a similar large loss much later in retirement.

Chart 5 below illustrates this concept more clearly. In the table on the left, we can see two different hypothetical sequences of returns over 20 years. Not only do both sequences have an average return of 5.5% but sequence #2 is actually exactly the same as sequence #1 only in reverse order. It should be noted that sequence #2 suffers from a large loss of -22% in the first year after retirement.

The graph on the right shows how a starting account value of \$300,000 with annual withdrawals of \$20,000 would change over time, based on these two different sequences of returns. We see that whereas sequence #1 still had a value of about \$180,000 after 20 years, sequence #2 was completely depleted in year 19.

The order of returns impacts investment portfolios subject to withdrawals.

Chart 5 – Outcome for different sequence of returns



This is a hypothetical example used for illustrative purposes only and is not intended to predict or project investment results.

How can individuals address sequence of returns risk?

Although individuals can choose when they want to retire, they cannot choose the set of returns that they will receive soon after retiring. Therefore, the best way to mitigate sequence of returns risk is for retirees to reduce their exposure to riskier assets such as stocks. However, this again will lead to increasing longevity, inflation, or interest rate risk.

Another way to reduce sequence of returns risk is to dedicate a portion of a retirement portfolio to handle the periodic withdrawals in retirement so that the remaining part of the portfolio can remain invested in the market. An example of this would be to convert a portion of one's portfolio into guaranteed lifetime income.

Conclusion

In this paper, we discussed five major risks that individuals face in retirement (longevity risk, inflation risk, interest rate risk, stock market risk and sequence of returns risk) and presented some ways to mitigate each of these risks. However, it's clear that in trying to reduce one risk, retirees are likely to take on other risks. The purpose of gaining a better understanding of the major risks in retirement is hopefully to create better solutions so that retirees can pursue better outcomes. For those with the means to do so, we recommend that they work with an advisor to identify a portfolio with the right risk/return characteristics to meet their individual goals and preferences.



1. <https://www.soa.org/Research/age-wise.aspx>
2. * <https://www.ssa.gov/planners/retire/r&m6.html>
3. Nominal returns (not real returns)

Guarantees are based on the claims-paying ability of the issuer.

Please note that no strategy can eliminate or anticipate all market risks and losses can occur.

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