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# How the sequence of returns can impact your retirement savings

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## Will your savings last through retirement?

For investors entering retirement, high portfolio returns are important, but they are only one factor influencing how long their savings will last. Another factor is the order or sequence of returns. There is a simple mathematical reason for this: regular withdrawals progressively diminish a portfolio's dollar value and that dollar value is the base on which future returns compound. When negative returns occur near the outset, the investor is left with a smaller base on which future positive returns can compound.

Over time that base continues to decline with each additional income withdrawal. This could result in retirement savings running out much sooner than if the portfolio experienced positive returns at the start of the withdrawal period.

### Illustrative scenarios

The best way to illustrate this risk is to look at three different scenarios. Three retirees starting the withdrawal period with identical savings can have entirely different financial outcomes, depending on the sequence of their returns. The following hypothetical example in Figure 1 presents these scenarios over a five-year period.

In Scenario 1, the sequence of returns goes from the most positive returns in the first year to the most negative in the final year. Scenario 2 starts with the most negative returns and moves forward to the most positive. Finally, Scenario 3 earns a constant (average) return in each of the five years.

Fig. 1 | Illustrative scenarios

Year	Return scenario 1 Early positive returns	Return scenario 2 Early negative returns	Return scenario 3 Constant returns
1	15%	-7%	5%
2	13%	-5%	5%
3	11%	11%	5%
4	-5%	13%	5%
5	-7%	15%	5%
Total return	<b>27%</b>	<b>27%</b>	<b>27%</b>
Average annualized	<b>5%</b>	<b>5%</b>	<b>5%</b>

**Each scenario follows a different path, but all end with a compounded total return of 27% and an average annualized rate of return of 5% over five years.**

### The outcome if no withdrawals are made

The sequence of returns has no impact on the portfolio's final dollar value when no withdrawals (or additions) are made over the course of the five-year investment. As Figure 2 illustrates, the ending value in all three scenarios is the same, even though each travels a different path to arrive there.

### What happens when withdrawals are made?

However, if income is withdrawn from the portfolio during the period, the end result for each scenario could be very different. The portfolio that experiences the negative returns at the beginning is not able to keep up with the portfolio that experiences the positive returns up front. This is because when the positive returns come later they compound on a smaller and declining base. The result is that the ending dollar value is lower than it is with the two other scenarios.

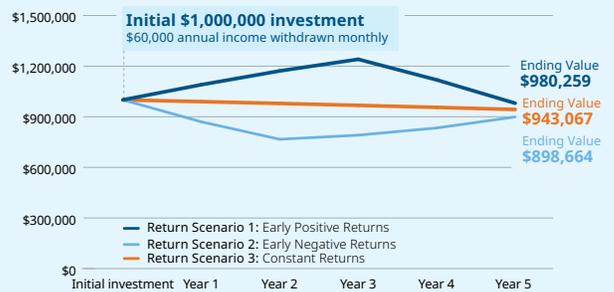
Figure 3 illustrates what happens when \$5,000 is withdrawn every month (for a total of \$60,000 a year). The longer the time period, the larger this divergence could become.

Figure 4 shows the same five-year sequence of returns repeated six times to create a 30-year period. Even though all three scenarios over this period would have earned an average annualized rate of return of 5%, the dollar value of each portfolio would continue to grow apart. Eventually, the portfolio in Scenario 2 (beginning with negative returns) would run out of money before the others. The portfolio in Scenario 1 (beginning with positive returns), on the other hand, would have ended with a dollar value of \$763,747, and would have been able to continue paying income.

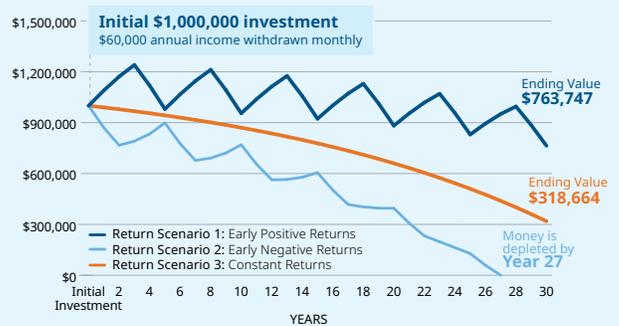
**Fig. 2 | No withdrawals**



**Fig. 3 | Withdrawals**



**Fig. 4 | Extended period of withdrawals**



For illustrative purposes only.

## Sequence of returns in the “real world”

It is very unlikely that two actual portfolios would perform as they did in the above scenarios, with one experiencing returns that move from high to low, and the other the exact opposite. Sequence-of-returns risk, however, can manifest itself in similar scenarios when a significant negative market event occurs near the beginning of an investment period.

To illustrate, we’ve created a hypothetical example in Figure 5 using actual market data. Investor A entered the market on January 1, 1998. Investor B entered seven months later on August 1, 1998. In mid-August, the Russian financial crisis hit.

Although the investments were made only seven months apart, the outcomes after 20 years are nearly \$778,990 apart. One portfolio obviously benefits from the initial positive performance before the Russian financial crisis caused a correction, while the other did not, making this more of a timing issue.

Sequence-of-returns risk, however, is magnified when regular monthly withdrawals of \$5,000 are made during the same return series. In Figure 6, the performance looks different because each portfolio’s dollar value – its compounding base – is declining as withdrawals are made throughout the period.

**Fig. 5 | Sequence of returns risk**



Source: Morningstar, based on the S&P 500. For illustrative purposes only

**Fig. 6 | Sequence of returns risk with withdrawals**



Source: Morningstar, based on the S&P 500. For illustrative purposes only

## Enhancing and preserving portfolio stability across the entire investing life-cycle

Controlling the effects of market volatility on a portfolio could be one way to reduce sequence-of-returns risk. Retirees today may wish to consider moving beyond traditional asset classes and strategies to manage volatility while enhancing returns.

An alternative approach could be one solution. Alternative solutions take two main forms: those that offer access to alternative asset classes such as commodities, currencies

and real estate and those that use alternative strategies such as shorting and leverage. Both types of alternative solutions offer enhanced diversification via the use of asset classes and strategies with lower correlation to traditional assets, which leads to potentially higher returns, lower volatility in a portfolio for a smoother and less stressful investment experience, and preserving capital over a longer-term horizon.



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