

THE PROCESS OF MANAGING RETIREMENT INCOME

SEQUENCE OF RETURNS & REVERSE DOLLAR COST AVERAGING



Re-ordering the sequence of annual returns on an investment provides great insight for planning a retirement distribution strategy. While this would have no effect on an investment of a buy-and-hold investor, the effect on a retirement portfolio under the stress of systematic withdrawals can be quite dramatic.

The road of retirement should be paved with more than good intentions. Soon-to-be retirees need to develop and follow a retirement income plan that balances current lifestyle and long-term sustainability of the retirement portfolio. *The Road of Retirement* series provides some best practices for accomplishing this balance.

Sequence of returns is simply the order in which returns are realized by a retiree. The consequences of a bad sequence of returns, especially early in retirement, can mean premature depletion of the portfolio. Retirees need to avoid being in the position of having to sell during inopportune market environments. Being forced to sell at the wrong time can result in “reverse dollar cost averaging”, a related risk we will also address in this article.

Sequence of Returns

To illustrate the importance of the sequence of returns to retirees and just how misleading using a historical average return can be, let’s look at a 20-year period (1989-2008) of returns for the S&P 500. We used this period to illustrate the impact that the sequence of returns might have had for a retiree who began retirement right before the beginning of the 2008 financial maelstrom. You can see from **figure one** that the average return for this twenty-year period was 8.43%. Reverse the sequence, 2008–1989, and once again, the average annual return is 8.43%! This average annual return is only relevant to an investor who did not invest or withdraw additional funds during this entire 20-year period. For retirees taking systematic withdrawals, the order in which they realize their returns is crucial to the long-term sustainability of the retirement portfolio.

To more fully understand the impact of the sequence of the returns, review the 1989–2008 returns and note how nine of the first ten years had positive returns which would have allowed the portfolio to grow nicely. Conversely, for the 2008–1989 sequence, the first year experienced a substantial decline of negative 37% and four of the first ten years

FIGURE 1. S&P 500 INDEX SEQUENCE OF RETURNS

Year	1989-2008 Sequence	2008-1989 Sequence
1	31.69	-37.00
2	-3.11	5.49
3	30.47	15.84
4	7.62	4.91
5	10.08	10.88
6	1.32	28.68
7	37.58	-22.10
8	22.96	-11.88
9	33.36	-9.11
10	28.58	21.04
11	21.04	28.58
12	-9.11	33.36
13	-11.88	22.96
14	-22.10	37.58
15	28.68	1.32
16	10.88	10.08
17	4.91	7.62
18	15.84	30.47
19	5.49	-3.11
20	-37.00	31.69
Avg. Annual Return	8.43%	8.43%

Past performance does not guarantee future results.
Source: S&P 500



were negative as well. This poor sequence would have created pressure on a portfolio that was already undergoing the stress of systematic withdrawals.

Impact in Retirement

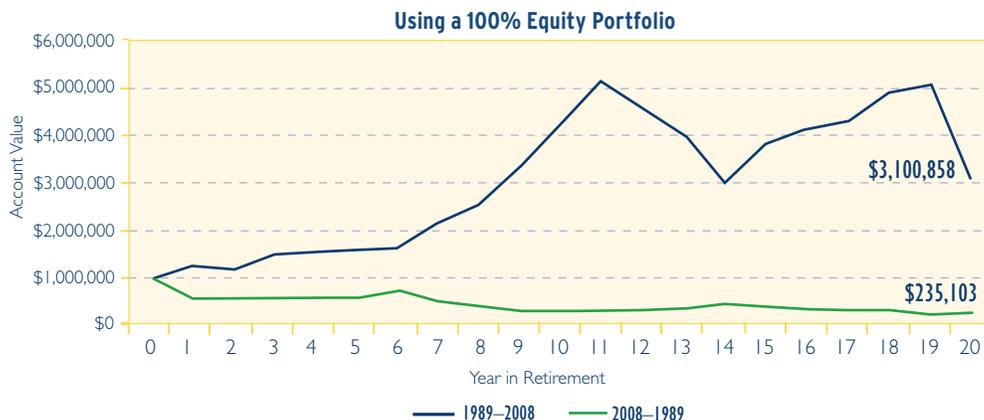
To illustrate the combined effects of systematic withdrawals and sequence of returns, let's use the 1989–2008 and 2008–1989 sequences on a retiree who has a hypothetical \$1 million in retirement savings, wishes to spend \$50,000 (5% initial withdrawal rate) in the first year, and is indexed to inflation (3.0% average).

The portfolio is invested 100% in equities represented by the S&P 500 Index. As you can see from the chart in **figure two**, after 20 years in retirement, the 1989–2008 sequence has supported the retirement spending and allowed the account value to grow to over \$3.1 million. However, the results for the 2008–1989 sequence are quite different. The negative 37% performance in year one followed by significant negative returns in years seven, eight, and nine dramatically deteriorated the account value to approximately \$235,000.

Reverse Dollar Cost Averaging

During the pre-retirement or accumulation stage, investors making systematic deposits into an investment portfolio will typically benefit from “dollar cost averaging”. This benefit results from nothing more than taking advantage of periodic drops in the price of an investment being systematically

FIGURE 2. SEQUENCE OF RETURNS IMPACT ON A HYPOTHETICAL \$1 MILLION INVESTMENT UNDERGOING SYSTEMATIC WITHDRAWALS



Hypothetical investment for both sequences consists of 100% equities, represented by the S&P 500 Index.

Past performance does not guarantee future results.

Source: Thornburg Investment Management

purchased. During these periods of share price decline, the investor is getting more shares for the dollars being invested.

Once an investor retires and begins to receive systematic withdrawals from their retirement portfolio, these periodic declines in the price of these shares, now being sold to cover expenses, becomes detrimental. Retirees look to generate a certain amount of dollars to pay expenses so when the share prices of the investments in the portfolio decline, the retiree has to sell more shares to raise the dollars needed. This is “reverse” dollar cost averaging. To illustrate, assume a hypothetical retirement portfolio of \$1 million, that represents 100,000 shares valued at \$10.00 per share. Also assume that \$50,000 is needed per year to support expenses. **Figure three** shows how many shares will need to be liquidated each year at various share prices as they move with the market. Note in the two examples in year one, at \$10.00 per share, only 5,000 shares needed to be sold.

FIGURE 3. REVERSE DOLLAR COST AVERAGING EXAMPLES

Optimal

Year	Share Price	Withdrawal Amount	Shares Sold
Beginning	\$10		
1	\$10	- \$50,000	- 5,000
2	\$12	- \$50,000	- 4,167
3	\$13	- \$50,000	- 3,846
4	\$9	- \$50,000	- 5,556
5	\$10	- \$50,000	- 5,000

Initial Share Value	\$10.00	
Average Share Price	\$10.80	
Total Shares Sold		-23,569

Not Optimal

Year	Share Price	Withdrawal Amount	Shares Sold
Beginning	\$10		
1	\$10	- \$50,000	- 5,000
2	\$6	- \$50,000	- 8,333
3	\$7	- \$50,000	- 7,143
4	\$9	- \$50,000	- 5,556
5	\$10	- \$50,000	- 5,000

Initial Share Value	\$10.00	
Average Share Price	\$8.40	
Total Shares Sold		-31,032

Now take into account the effects of two different sets of returns. On the left is an optimal scenario in which the market value of the shares only dipped below the original price in year four. On the right, however, the share value spent three of the five years below the original price, not a desirable scenario. Having to sell shares while the market is down places additional strain on a retirement portfolio. That money is systematically removed for spending so it never has the chance to recover, if and when the markets recover. Note, in the boxes under the tables, the difference in the average share value and the number of

The above charts are designed to demonstrate the mathematical principle behind reverse dollar cost averaging. The illustrations are hypothetical and are not intended to serve as a projection of the investment results of any particular investment.

shares sold for each example. Striving to mitigate selling shares in a poor market environment should be a focus when structuring a retirement portfolio.

Best Practices

To help alleviate the effects of the sequence of returns and reverse dollar cost averaging, there are four very simple best practices that can be incorporated into your retirement income planning.

1. **Diversify Your Portfolio** by staying invested in cash, fixed income, and stocks. Had the retiree used a hypothetical 60/40 balanced portfolio instead of just equity investments, the results for the 2008–1989 sequence would have been better. *Figure four* illustrates this scenario. Having a diversified portfolio where the investments performing poorly do not have to be sold to fund spending needs can be crucial to the long-term sustainability of the retirement portfolio.

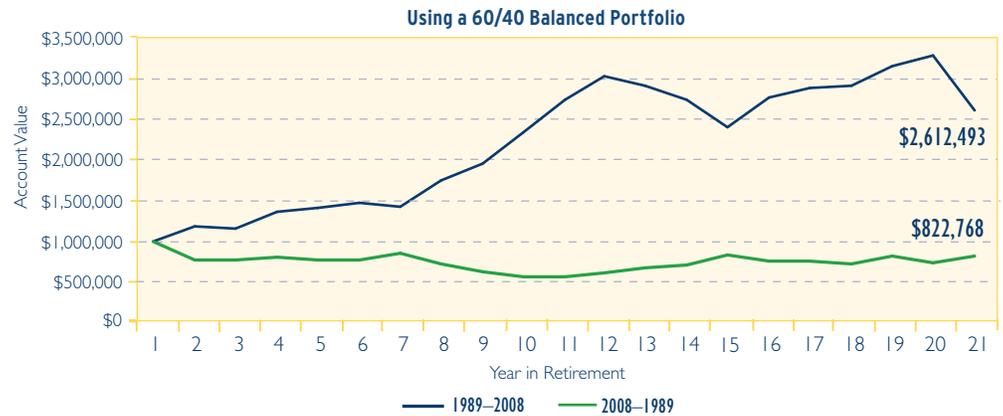
2. **Use a Cash Flow Reserve Ladder** (see related paper in this series) when structuring the portfolio to provide allocations to cash and short-term, highly liquid investments. The retiree is not under duress to have to sell, which can be especially beneficial in years like 2008, when both fixed income and equities were undervalued in the market.

3. **Develop a Growing Income Stream** using high and growing dividend-paying stocks for the equity portion of the portfolio can provide a growing income stream that should reduce the dependency on capital appreciation to achieve the retirement plan (see related article in this kit).

4. **Use a Trusted Financial Advisor** who can help thoughtfully develop and manage your retirement income plan. They can provide a line of defense during times of market turbulence.

While there is no way to adequately predict the sequence of returns you will experience during your retirement, you can control the timing of when you sell your assets to support expenses. Using the strategies outlined in this article can provide a framework that will help alleviate the negative effects of reverse dollar cost averaging and should be appropriate for the majority of retirees looking to retain control over their retirement assets.

FIGURE 4. SEQUENCE OF RETURNS IMPACT ON A HYPOTHETICAL \$1 MILLION INVESTMENT UNDERGOING SYSTEMATIC WITHDRAWALS



Balanced Portfolio: 60% large cap stocks (S&P 500 Index) / 40% intermediate-term government bonds (Barclays Intermediate-term Government Bonds Index)

Past performance does not guarantee future results.

Source: Thornburg Investment Management

Disclosures:

Following these strategies does not assure or guarantee sustainability of a retirement portfolio or better performance nor do they protect against investment losses.

Investments carry risks, including possible loss of principal. Bonds are subject to certain risks, including interest rate risk, credit risk, and inflation risk. The principal value of bonds will fluctuate relative to changes in interest rates, decreasing when interest rates rise. Investments in equity securities are subject to additional risks, such as greater market fluctuations. Investments in stocks and bonds are not FDIC insured, nor are they deposits of or guaranteed by a bank or any other entity.

The views expressed in this article are subject to change.

Diversification does not assure or guarantee better performance and cannot eliminate the risk of investment losses.

Barclays Intermediate-term Government Bond Index – covers all publicly issued, non-convertible, fixed rate, dollar-denominated U.S. Government securities with a maturity between 1 and 10 years. Issues are rated at least Baa3/BBB by two of the following rating agencies: Moody's, Fitch or S&P.

The S&P 500 Index is an unmanaged broad measure of the U.S. stock market.

The performance of any index is not indicative of the performance of any particular investment. Unless otherwise noted, index returns reflect the reinvestment of income dividends and capital gains, if any, but do not reflect fees, brokerage commissions or other expenses of investing. Investors may not make direct investments into any index.