

PORTFOLIO STRATEGIES

How Rebalancing Helps When Downturns Strike Early

Retirees making withdrawals from diversified portfolios who rebalanced had a better outcome than those who did little to preserve their allocation weightings.

BY CHARLES ROTBLUT, CFA

Time in the market matters if you want to harness the power of compounding. How you manage your portfolio during the time you are in the market matters too. Market downturns that occur early within a given period can have a lasting impact on a portfolio if corrective measures are not taken, especially after regular savings contributions have ended.

In this year's update to my ongoing analysis of portfolio rebalancing, I show how the timing of three of the past four bear markets (the dot-com crash, the global financial crisis and 2022's stock market decline) combined to have a lasting impact. The impact is evident even with last year's strong rebound in the S&P 500 index.

Retirees making withdrawals from diversified portfolios who took measures to maintain their allocations—such as rebalancing—had a better outcome than those who did little to preserve their allocation weightings. Those who did not take withdrawals only gave up a small amount of returns to benefit from lower volatility.

Before getting into the details, here are a few takeaways:

- » Bear markets have a particularly notable impact when they occur early in retirement. This is because portfolio balances are large, and no additional savings contributions are being made.
- » The withdrawal portfolios ended 2023 with their lowest balance of all rolling 25-year periods analyzed because of when the bear markets occurred.
- » Ending balances for the rebalanced and non-rebalanced non-withdrawal portfolios were close for the most recent 25-year period ending in 2023. This was the case for both the moderate and aggressive allocations.



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- » We altered how withdrawals are taken from each asset class group from our prior analysis of rebalancing.

It Matters When a Bad Sequence of Returns Occurs

Sequence risk refers to the chance of incurring ill-timed negative returns. Repeating what I've written before, sequence risk matters to those who are currently taking or will need to take withdrawals within the next few years. Sequence risk can also make investors who don't need withdrawals nervous enough to shift money out of stocks. This nervousness occurs even though sequence risk can be a friend to those who are in the process of building long-term wealth and won't need to take withdrawals within the foreseeable future.

Consider the 25-year rolling period used for this year's analysis. It ran from January 1999 through December 2023. During this period, the S&P 500 incurred calendar-year drops of 9.1% in 2000, 12.0% in 2001 and 22.2% in 2002. It then plunged by 37.0% in 2008. These combined for four down years in less than a decade.

A retiree whose portfolio was fully allocated to an S&P 500 fund and used an inflation-adjusted withdrawal rate would have seen their starting balance of \$100,000 dwindle to \$42,348 by the end of 2008. They would have completely drained their savings before the end of 2019.

The scenario assumes that withdrawals equal to 4.5% of the portfolio's starting balance were taken and adjusted upward every calendar year to account for inflation. The damage done to the portfolio illustrates the importance of making periodic adjustments along the way. These adjustments can be rebalancing (which we demonstrate here), adjusting the size of withdrawals or a combination of the two.

Rebalancing also worked from a psychological standpoint for investors who were saving. Our models show that the financial trade-off of rebalancing to reduce volatility was nominal for the non-withdrawal portfolios over the most recent 25-year period when done in a tax-preferred account.

The damage done to the portfolio illustrates the importance of making periodic adjustments along the way.

For those who took retirement or other withdrawals, rebalancing resulted in larger ending balances over the 1999–2023 period. This advantage occurred when either the aggressive or moderate allocations were followed.

Portfolios and Allocations Used to Test Rebalancing

Our analysis of rebalancing is based on hypothetical portfolios using the AAIL moderate investor Asset Allocation Model and the AAIL aggressive investor Asset Allocation Model.

The moderate allocation model modifies the traditional 60% equity/40% fixed-income allocation strategy by incorporating greater diversification on the equity side and a shorter duration (meaning less interest rate sensitivity) on the bond side. Specifically, the model calls for allocating 20% to large-cap stocks, 15% to mid-cap stocks, 10% to small-cap stocks and 15% to international stocks. On the bond side, it calls for a 30% allocation to intermediate-term bonds and a 10% allocation to short-term bonds. (An intermediate-term bond fund is used for the entire bond allocation in the rebalancing models.)

The aggressive allocation model has 90% in equities and 10% in fixed income. The model calls for allocating 20% to large-cap stocks, 20% to mid-cap stocks, 20% to small-cap stocks, 20% to international stocks and 10% to emerging markets stocks. On the bond side, it calls for a 10% allocation to intermediate-term bonds. (Cash and cash equivalents, such as a money market fund, could be used in lieu of bonds.)

Figure 1 shows the characteristics and hypothetical returns for AAIL's allocation models.

The portfolios use Vanguard mutual funds to replicate the returns an investor could have realized after fund fees are factored in. The Investor share class of funds was used for the period of 1988 through 2017. The Admiral share class of funds was substituted in 2018 because Vanguard stopped offering the Investor shares class to most investors. Part of the goal of this study is to show the returns an investor could have realized in a real-world portfolio, gross of taxes and specific account fees.

Twelve rolling 25-year period models are the subsets, with starting dates ranging from 1988 to 1999.

The hypothetical portfolios are either non-withdrawal or withdrawal. As the name implies, no withdrawals were taken out of the non-withdrawal portfolios.

A Tweak Made to How Withdrawals Are Taken

The withdrawal portfolios assume that a retiree makes

FIGURE 1

AAII Asset Allocation Models

 Aggressive Investor 90% Diversified Stock	 Moderate Investor 60% Diversified Stock	 Conservative Investor 40% Diversified Stock
Time Horizon	Time Horizon	Time Horizon
Long 20+ Years: Investment Horizon <i>For investors who are very risk tolerant</i>	Mid-Term 15+ Years: Investment Horizon <i>For investors who can tolerate some risk</i>	Short-Term 10+ Years: Investment Horizon <i>For investors who are not risk tolerant</i>
Characteristics	Characteristics	Characteristics
Growth: Substantial Income: Very Low Risk: Substantial Year-to-Year Volatility of Portfolio Value 8% Average Annual Growth in Value -37% Bad Year	Growth: Moderate Income: Low Risk: Moderate Year-to-Year Volatility of Portfolio Value 7% Average Annual Growth in Value -21% Bad Year	Growth: Low Income: Moderate Risk: Low Year-to-Year Volatility of Portfolio Value 6% Average Annual Growth in Value -12% Bad Year
Allocations	Allocations	Allocations
10% Fixed Income 90% Diversified Stock Portfolio Return YTD: -1.1% 1 yr: 7.6% 5 yrs: 8.2% 10 yrs: 7.5%	40% Fixed Income 60% Diversified Stock Portfolio Return YTD: -0.2% 1 yr: 7.4% 5 yrs: 6.5% 10 yrs: 6.0%	60% Fixed Income 40% Diversified Stock Portfolio Return YTD: 0.2% 1 yr: 6.8% 5 yrs: 5.0% 10 yrs: 4.6%

annual withdrawals based on an inflation-adjusted 4.5% rate. A withdrawal equal to 4.5% of the portfolios' balances at the end of the first year was taken. This initial withdrawal rate was then increased each year by the rate of inflation. The strategy is based on research by retired financial planner William Bengen. (Required minimum distributions, or RMDs, were not used because age, account type and life expectancy would impact the calculation of the withdrawal rate.)

The year-over-year change in the consumer price index for all urban consumers (CPI-U) was used to determine the inflation adjustment. This benchmark can be substituted with a different measure.

In our prior articles on rebalancing, withdrawals were taken evenly from each of the funds in the moderate allocation portfolios. We tweaked the strategy this year so that withdrawals are proportionate to the prior year's portfolio weighting for each fund. For example, the large-cap (S&P 500) fund accounted for 24.4% of the non-rebalanced withdrawal's portfolio total balance at the end of 2022 when the moderate allocation was used. Therefore, in 2023, 24.4% of the year's total withdrawal came from the large-cap fund.

This change was made to better approximate what retirees do in terms of deciding which funds to withdraw from.

TABLE 1

Moderate Allocation Non-Withdrawal Portfolios

25-Year Rolling Periods

	Ending Portfolio Value (\$)	Total Return (%)	Annualized Return (%)	Standard Deviation (%)
Rebalance at 5% Thresholds				
1999–2023	499,211	399.2	6.6	11.3
1998–2022	505,767	405.8	6.7	11.3
1997–2021	702,846	602.8	8.1	10.4
1996–2020	700,386	600.4	8.1	10.4
1995–2019	652,367	552.4	7.8	11.0
1994–2018	586,232	486.2	7.3	11.0
1993–2017	750,726	650.7	8.4	10.4
1992–2016	621,977	522.0	7.6	10.5
1991–2015	934,476	834.5	9.4	11.6
1990–2014	794,466	694.5	8.6	10.9
1989–2013	908,363	808.4	9.2	11.2
1988–2012	865,698	765.7	9.0	11.1
No Rebalancing				
1999–2023	499,366	399.4	6.6	12.2
1998–2022	487,637	387.6	6.5	12.4
1997–2021	718,775	618.8	8.2	11.6
1996–2020	705,504	605.5	8.1	12.0
1995–2019	790,141	690.1	8.6	12.4
1994–2018	628,092	528.1	7.6	13.0
1993–2017	764,308	664.3	8.5	12.0
1992–2016	708,537	608.5	8.1	11.9
1991–2015	840,689	740.7	8.9	12.8
1990–2014	791,449	691.4	8.6	12.2
1989–2013	893,764	793.8	9.2	12.8
1988–2012	784,640	684.6	8.6	12.6

While we can't model the decisions made by each individual investor, this is a more realistic way of allocating where dollars get withdrawn from within a portfolio.

It also proved to be beneficial to the non-rebalanced withdrawal portfolios. Not once did any of the fund balances fall to \$0. Ending balances also increased. The lowest ending balance was \$79,435 (for the period of 1999–2023). The ending balance was \$25,022 at the end of 2023 for the same portfolio under the older methodology with equity allocations drained down to \$0.

How We Rebalanced the Portfolios

Rebalancing took place whenever a specific allocation was more than five percentage points above or below its target at year-end. This threshold band is based on research by Vanguard. It allows the portfolio to benefit from short-term momentum in asset class groups while not straying too far from its targeted allocation.

TABLE 2

Aggressive Allocation Non-Withdrawal Portfolios

25-Year Rolling Periods

	Ending Portfolio Value (\$)	Total Return (%)	Annualized Return (%)	Standard Deviation (%)
Rebalance at 5% Thresholds				
1999–2023	594,830	494.8	7.4	16.8
1998–2022	567,757	467.8	7.2	16.7
1997–2021	826,315	726.3	8.8	15.9
1996–2020	809,796	709.8	8.7	15.9
1995–2019	895,572	795.6	9.2	16.2
1994–2018	660,524	560.5	7.8	16.3
1993–2017	911,683	811.7	9.2	15.6
1992–2016	808,536	708.5	8.7	15.5
1991–2015	1,117,484	1017.5	10.1	17.4
1990–2014	862,812	762.8	9.0	16.1
1989–2013	1,010,568	910.6	9.7	16.4
1988–2012	940,528	840.5	9.4	16.1
No Rebalancing				
1999–2023	606,373	506.4	7.5	17.4
1998–2022	582,367	482.4	7.3	17.4
1997–2021	869,703	769.7	9.0	16.4
1996–2020	848,107	748.1	8.9	16.6
1995–2019	945,771	845.8	9.4	16.5
1994–2018	738,353	638.4	8.3	17.9
1993–2017	932,157	832.2	9.3	15.9
1992–2016	848,541	748.5	8.9	15.9
1991–2015	1,015,614	915.6	9.7	16.4
1990–2014	922,789	822.8	9.3	16.4
1989–2013	1,052,937	952.9	9.9	16.8
1988–2012	962,365	862.4	9.5	16.5

Rebalancing Limited the Damage of Sequence Risk

A walk through some of the numbers from the 1999–2023 period will allow us to better illustrate the lasting impact of two bear markets occurring early in the investment period. The portfolios had a starting balance of \$100,000 in January 1999, as previously noted.

We'll start with the moderate non-withdrawal portfolios to keep the example simple.

The rebalanced non-withdrawal portfolio had a slight wealth advantage versus the non-rebalanced portfolio after five years: \$129,639 versus \$126,670. Rebalancing, in this case, involved shifting portfolio dollars into stocks at the end of 2002 following the bear market drop. This led to a larger rebound in the rebalanced portfolio relative to the non-rebalanced portfolio. By the end of 2007, the rebalanced portfolio was worth nearly \$5,500 more than the non-rebalanced portfolio (\$189,176 versus \$183,719).

This advantage widened to more than \$13,000 by the end of 2009. Even so, both portfolios had yet to recover

TABLE 3

Moderate Allocation 4.5% Withdrawal Portfolios

25-Year Rolling Periods

	Ending Portfolio Value (\$)	Total Return (%)	Annualized Return (%)	Standard Deviation (%)	Total Withdrawals (\$)
Rebalance at 5% Thresholds					
1999–2023	103,327	3.3	0.1	10.8	163,288
1998–2022	135,090	35.1	1.2	11.0	171,232
1997–2021	183,196	83.2	2.5	10.1	174,684
1996–2020	263,933	163.9	4.0	10.1	166,236
1995–2019	300,560	191.1	4.4	10.5	187,487
1994–2018	292,893	185.3	4.3	10.4	151,789
1993–2017	307,617	207.6	4.6	10.4	173,946
1992–2016	292,304	192.3	4.4	10.0	161,900
1991–2015	347,415	247.4	5.1	10.4	190,781
1990–2014	372,036	272.0	10.6	5.4	156,599
1989–2013	364,165	264.2	5.3	10.8	195,493
1988–2012	395,764	295.8	5.7	10.7	186,732
No Rebalancing					
1999–2023	79,435	(20.6)	(0.9)	11.0	163,288
1998–2022	108,181	8.2	0.3	11.6	171,232
1997–2021	202,945	102.9	2.9	11.1	174,684
1996–2020	245,618	145.6	3.7	11.5	166,236
1995–2019	295,963	196.0	4.4	12.1	187,487
1994–2018	279,606	179.6	4.2	12.0	151,789
1993–2017	302,038	202.0	4.5	11.8	173,946
1992–2016	302,075	202.1	4.5	11.7	161,900
1991–2015	355,377	255.4	5.2	12.5	190,781
1990–2014	360,274	260.3	5.3	11.9	156,599
1989–2013	353,092	253.1	5.2	12.6	195,493
1988–2012	375,797	275.8	5.4	12.6	186,732

Withdrawals taken proportionately relative to each fund's prior-year weighting in the portfolio.

from the global financial crisis bear market. (Their balances were \$181,229 and \$167,955, respectively.) The rebalanced non-withdrawal portfolio went into the financial crisis with a lower allocation to equities than the non-rebalanced portfolio (60.1% versus 65.0% at the end of 2007) because the allocation was adjusted back to target at the end of 2006. It was then rebalanced at the end of 2008 due to the equity allocations falling too far below their allocation targets.

The non-rebalanced portfolio's equity weighting grew in the years following the global financial crisis from 57.5% at the end of 2009 to 80.2% in 2023. This increasing exposure to equities—particularly large- and mid-cap domestic stocks—helped the portfolio to rebound more strongly during the 2010s and the early 2020s. Despite ending with an 80% allocation to stocks versus 62% for the rebalanced portfolio, its ending balance (\$499,366) was just barely higher than the rebalanced portfolio (\$499,211), as shown

TABLE 4

Aggressive Allocation 4.5% Withdrawal Portfolios

25-Year Rolling Periods

	Ending Portfolio Value (\$)	Total Return (%)	Annualized Return (%)	Standard Deviation (%)	Total Withdrawals (\$)
Rebalance at 5% Thresholds					
1999–2023	100,419	0.4	0.0	16.1	181,977
1998–2022	145,083	45.1	1.5	16.2	172,769
1997–2021	255,343	155.3	3.8	15.6	176,259
1996–2020	315,467	215.5	4.7	15.6	170,847
1995–2019	365,648	265.6	5.3	15.8	189,085
1994–2018	340,690	240.7	5.0	15.7	153,805
1993–2017	390,302	290.3	5.6	15.2	179,808
1992–2016	379,457	279.5	5.5	15.2	159,489
1991–2015	416,726	316.7	5.9	15.4	195,694
1990–2014	429,854	329.9	6.0	16.0	146,088
1989–2013	394,260	294.3	5.6	15.9	200,986
1988–2012	430,687	330.7	6.0	15.8	192,589
No Rebalancing					
1999–2023	97,897	(2.1)	(0.1)	16.2	181,977
1998–2022	144,272	44.3	1.5	16.4	172,769
1997–2021	270,393	170.4	4.1	15.8	176,259
1996–2020	321,508	221.5	4.8	15.8	170,847
1995–2019	390,938	290.9	5.6	16.1	189,085
1994–2018	351,585	251.6	5.2	15.9	153,805
1993–2017	403,266	303.3	5.7	15.8	179,808
1992–2016	402,737	302.7	5.7	15.6	159,489
1991–2015	466,876	366.9	6.4	16.0	195,694
1990–2014	466,486	366.5	6.4	16.2	146,088
1989–2013	427,581	327.6	6.0	16.4	200,986
1988–2012	447,835	347.8	6.2	16.1	192,589

Withdrawals taken proportionately relative to each fund's prior-year weighting in the portfolio.

in Table 1.

Sequence risk had a similar impact when the aggressive allocation was used. The difference in wealth between the non-rebalanced non-withdrawal portfolio (\$606,373) and rebalanced non-withdrawal portfolio (\$594,830) was less than 2% (Table 2).

Rebalancing Worked Better When Withdrawals Were Taken

The period of 1999–2023 was the toughest 25-year period for the withdrawal portfolios. The rebalanced withdrawal portfolio following the moderate allocation ended with a balance of \$103,327, just slightly above its starting balance of \$100,000. The non-rebalanced portfolio fared worse with an ending balance of \$79,435 (Table 3).

The difference in value between the two portfolios started in 2003. The rebalanced withdrawal portfolio was

first rebalanced at the end of 2002. The equity allocation for both portfolios fell from their beginning target of 60% in 1999 to 48%. The rebalanced withdrawal portfolio shifted dollars back into stocks, enabling it to be better positioned to take advantage of the rebound in stock prices in 2003.

A similar thing happened at the end of 2008. The rebalanced withdrawal portfolio rebalanced its allocation back to target while the non-rebalanced portfolio did not. By the end of 2023, the rebalanced withdrawal portfolio was worth 30% more than its non-rebalanced counterpart.

For 10 out of the 12 rolling periods analyzed so far, the rebalanced withdrawal portfolios following the moderate (60%/40%) allocation have ended with larger balances than the non-rebalanced portfolios.

Rebalancing also helped the withdrawal portfolios following the aggressive (90%/10%) allocation. The rebalanced withdrawal portfolio ended the 1999–2023 period with a balance of \$100,419. The non-rebalanced portfolio had an ending value of \$97,897 (Table 4). Again, it was the timing of the bear markets and the adjustments made that helped the rebalanced portfolio.

Adjustments That Lessen Sequence Risk

There are a few adjustments retirees can make to limit the damage of sequence risk. The first is to periodically rebalance the portfolio. As noted, the rebalanced withdrawal portfolio following the moderate allocation ended 2023 with \$103,327 after starting 25 years earlier with a balance of \$100,000. During this time, \$163,288 in cumulative withdrawals were taken.

Taking withdrawals proportionately based on each asset class group's allocation helps whether or not rebalancing is used. When we adjusted the withdrawals to match each fund group's allocation from the prior year, the non-rebalanced portfolio ended 2023 with a balance of \$79,435, as previously noted. All its original fund holdings were maintained. This was not the case when we split the annual withdrawal amount evenly across all asset class groups—the strategy we used in previous rebalancing articles.

Flexibility can also be used when determining how much to withdraw each year. This works regardless of the allocation model chosen and whether or not rebalancing is used. It does require the financial flexibility to reduce withdrawals or hold them steady.

Finally, maintaining an allocation to buffer assets like cash can allow you to avoid selling stocks when their prices are down. This is the approach used by AAI's Level3 withdrawal strategy. See the feature article in this issue on page 7 for more on the benefits of maintaining a cash position in retirement. ■

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